HOSPITAL ADMINISTRATION

by

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PREFACE

The Administrator of a hospital, particularly of a teaching hospital, is faced with the task of organising increasingly complex and specialised, high technology institutions, under constant pressure to improve patient care and community services, training of health personnel, and to seek new knowledge, therapies and techniques. In addition, acute general hospitals are being forced to re-examine their goals and functions in the light of greater competition from other health and social services for scarce resources--and of changing environmental circumstances. These activities must be undertaken in the context of new theories of management with greater emphasis on the psycho-social aspects of organisation, decision-making processes and advances in information-processing techniques.

To be equipped for this task the hospital administrator must also acquire new knowledge and skills. It was therefore frustrating to discover that no training courses for hospital administrators, medical or otherwise were available in this country and that there was a dearth of literature with specific reference to the Republic. Thus it was as a measure of desperation that this thesis was embarked on, in order to satisfy a personal need to learn about the theory of administration and to meet the need for basic research into, and documentation of, hospital administration in South Africa.

In view of the necessity to study virtually every aspect of the subject and the fact that so little research had been done on the management of South African hospitals, it was felt that hospital administration should be examined as a totality rather than selecting any single aspect of the subject.

General Systems theory which views any open system as a whole, in constant interaction with its environment, provided an appropriate conceptual framework for the general study of hospital administration. The Groote Schuur Hospital Group provided a suitable model within which to examine the application of general systems theory; for analysis of the environment, resources, organisation and products of a hospital; and upon which to base some general conclusions regarding the administration of hospitals, recommendations for change and for further research.

This thesis which is presented in eight chapters with a short summary of the contents at the end of each chapter has examined one teaching hospital group as a whole system. No attempt has been made to study any aspect of hospital administration in great detail, but rather to identify areas where immediate changes can be implemented to improve the effective and efficient utilisation of resources, and those where further research is essential to find better ways of achieving these goals and meeting societal needs. In the words of Tenon--

> The hospital is the conscience of a civilisation whose worth, in the end will be measured not by articles of faith and lofty doctrines but by the way it nurtures life; succours distress, rights injustices and transforms misery, frailty and want into hope, dignity and sufficiency.[1]

ACKNOWLEDGEMENTS

Professor Jan Beekman has been my supervisor and mentor throughout most of the period during which this thesis was prepared. His absence during the critical period of final documentation, deprived me of much needed support and advice and made me realise how highly I valued his guidance. I am grateful to him and members of his department, particularly Mr. Don Livingstone, Athol Harrison and Lorraine Liedemann--and the other post-graduate students for their fellowship and assistance.

I am also deeply indebted to Dr. Reeve Sanders for her encouragement, support and for introducing me to hospital administration. Several members of the Groote Schuur Hospital administrative staff have given me invaluable assistance, particularly the Hospital Secretary, Mr. Les Fuller, his deputy, Mr. Wally Braund and Miss Christine Vader. Miss Patricia Brassell, Chief Matron, her deputy, Miss Olive Kilgour, and Miss Patricia Harrison, Senior Lecturer in The University of Cape Town, Department of Nursing, provided me with information, literature and advice for which I am very grateful.

The kindness, courtesy and interest of Miss Sheila Katcher and her librarians at the Medical School Library deserve special mention and thanks. June Koopman, Noeline Henkel, Desiree Slade and Susan Jones all helped with seemingly endless typing, but the major burden was borne by Debbie Rossouw whose patience, tolerance and unfailing good humour survived through innumerable drafts and I acknowledge her contribution with sincere gratitude. Mrs. Ruby MacDonald typed the final copy and gave me advice on the presentation for which I thank her.

Finally--my family--to whom this work is lovingly dedicated. Without their forbearance, enthusiasm and support I could not have completed this thesis. To my husband, who prepared all the figures for me and whose advice, help and constant encouragement sustained me, and to my children Mark, Peta, Gabrielle and Amanda, I am indebted beyond words or gratitude.

REFERENCE

1. Jacques Tenon, Memoirs sur les hospitaux de Paris (1788); Bibliotheque Nationale de France, Paris, NAF 22747, fols 55-56, cited by Louis S. Greenbaum "Measure of Civilisation: The Hospital Thought of Jacques Tenon on the Eve of the French Revolution" Bulletin of the History of Medicine 49 (1975): 56

1. THE HOSPITAL AS A SYSTEM

Twentieth century hospitals have their roots in many, divergent origins--the temples of Ancient civilisations, the xenodochia established by religious orders to house travellers, the infirmaries in monasteries, the alms houses and other institutions for society's outcasts--the poor, the sick, the aged and the mentally abnormal, and in the needs of armies for places to accommodate and treat the wounded.

Modern hospitals evolved as the result of the discovery of anaesthesia and asepsis in the middle of the last century. New surgical methods demanded appropriate conditions for their application--not available in private homes--and new methods of diagnosis and treatment required equipment that could only be provided in institutions.[1]

In the last quarter of the 20th century this process of development has advanced to such an extent that acute, general, teaching hospitals are now considered to be amongst the most complex of contemporary organisations.[2]

Fast-growing technology, high costs and rapid diversification have made the efficient administration of these hospitals a formidable and increasingly difficult task--particularly in terms of traditional concepts and principles of management. The advent and development of General Systems Theory, first propounded by von Bertalanffy in 1950[3], has provided a new conceptual approach to the analysis of organisations and their more effective management. Several writers have used the systems approach to the analysis of hospitals--notably. Rhenman, Kast and Rosenzweig, Greenfield, Durbin and Springall, and Lippitt,[4] whose work has made a substantial contribution to the understanding of hospitals as systems.

It was considered that a similar analysis of an academic hospital in South Africa would be of value in assessing the organisation and administration of hospitals in this country and in formulating proposals for change and improvement.

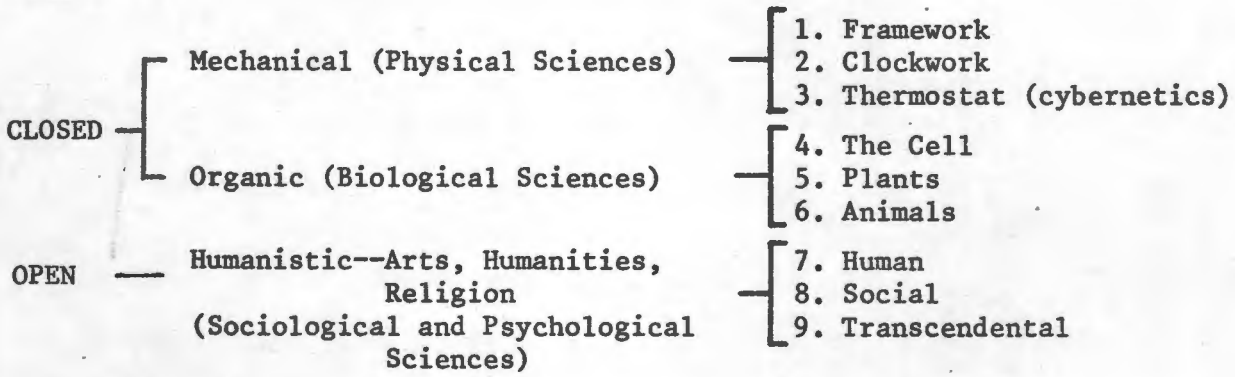
GENERAL SYSTEMS THEORY

In order to facilitate understanding of the systems approach, it is necessary to describe briefly the main tenets of general systems theory.

A system can be defined as an organised or complex whole which is more than the sum of its components and which can only be understood as a totality. Systems may be open or closed.

> A system is closed if no material enters or leaves it; it is open if there is import and export and, therefore, change of the components. Living systems are open systems, maintaining themselves in exchange of materials with the environment, and in continuous building up and breaking down of their components.[5]

Open systems, therefore, are living organisms with defined boundaries and are in constant interaction with the environment as materials are imported, processed and exported. Boulding classified systems into a hierarchy of nine levels[6]--which can be presented in a simplified form indicating the nature of the system i.e. open or closed; the relevant body of knowledge and the typology.



The mechanistic concept of cybernetics, which is concerned with self-regulatory control mechanisms and feedback of information has also been incorporated in the theory of organic, open systems, which are dependent upon communications and information-flow, internally and externally, for regulation and control.[7]

Open systems theory as applied to organisations, views the organisation as a dynamic social system with an external environment with which it constantly exchanges materials and information--and an internal system of interdependent relationships, which are constantly changing, adapting and evolving in response to internal and external pressures.[8]

Every system consists of a number of parts or sub-systems each of which may be further sub-divided into components or more sub-systems. Every system forms part of a supersystem. There is always--as with so many structures--an hierarchical relationship and vertical arrangement of the various levels of systems.

Open systems have certain other characteristics. The cyclical return of output as renewed energic input, and feedback of information from the environment and from within the system, are essential for survival of the system. The constant throughput of resources and information maintains the system in a steady state of dynamic equilibrium and enables the system to become negentropic. Dynamic open systems are subject to growth, elaboration and internal specialisation and are able to achieve their ends by a variety of means--the principle of equifinality.[9]

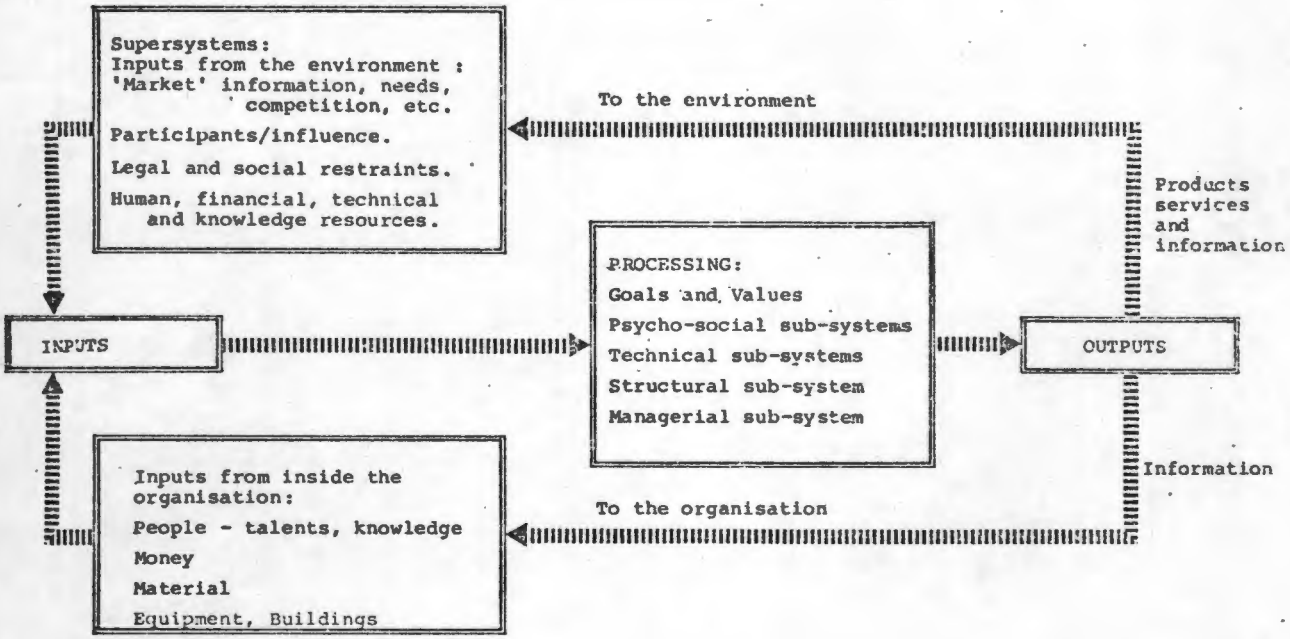


FIGURE 1.1 An Organisational System

SOURCE: Robert Buchele, The Management of Business and Public Organisations, (New York: McGraw-Hill Inc., 1977) p.29

The application of open systems theory to organisations is shown diagrammatically in Figure 1.1. It is the intention of this work to examine systematically and as a totality one acute, general, academic hospital --Groote Schuur Hospital--on the basis of this diagram. Groote Schuur is the main hospital in a Group, comprising maternity hospitals and alcoholic treatment centres, as well as Groote Schuur itself. The total number of beds in the Group is 1573 with the control of the entire complex vested in a Medical Superintendent. Groote Schuur Hospital is an acute general hospital with 1340 beds which is the main teaching unit for the nearby Medical School The hospital is situated close to Cape Town with its four associated hospitals dispersed within a six-mile radius and serving as a referral centre for the

rest of the Province.

As teaching hospitals, the Groote Schuur Group, with the exception of thirty Maternity and three general beds, are 'closed' hospitals. Patients are entitled to hospital and medical care from hospital employees and may not be treated by their private doctors. No accounts for medical services may be rendered to patients, who have been treated as outpatients or admitted to 'closed' beds, by any medical practitioner.

GROOTE SCHUUR HOSPITAL--THE ENVIRONMENT

The supersystem of which Groote Schuur Hospital is a component is the Health System of South Africa which is in turn a sub-system of Government and of society as a whole. One can visualise the larger society as a galaxy consisting of a myriad parts all of which interact in some way with some or all of the other parts. This is represented diagramatically in Figure 1.2 which indicates in a simple way the flow of goods, information and people between the 'stars' in the galaxy which form Groote Schuur Hospital's environment. The whole is linked, encircled and controlled by legislation and regulations.

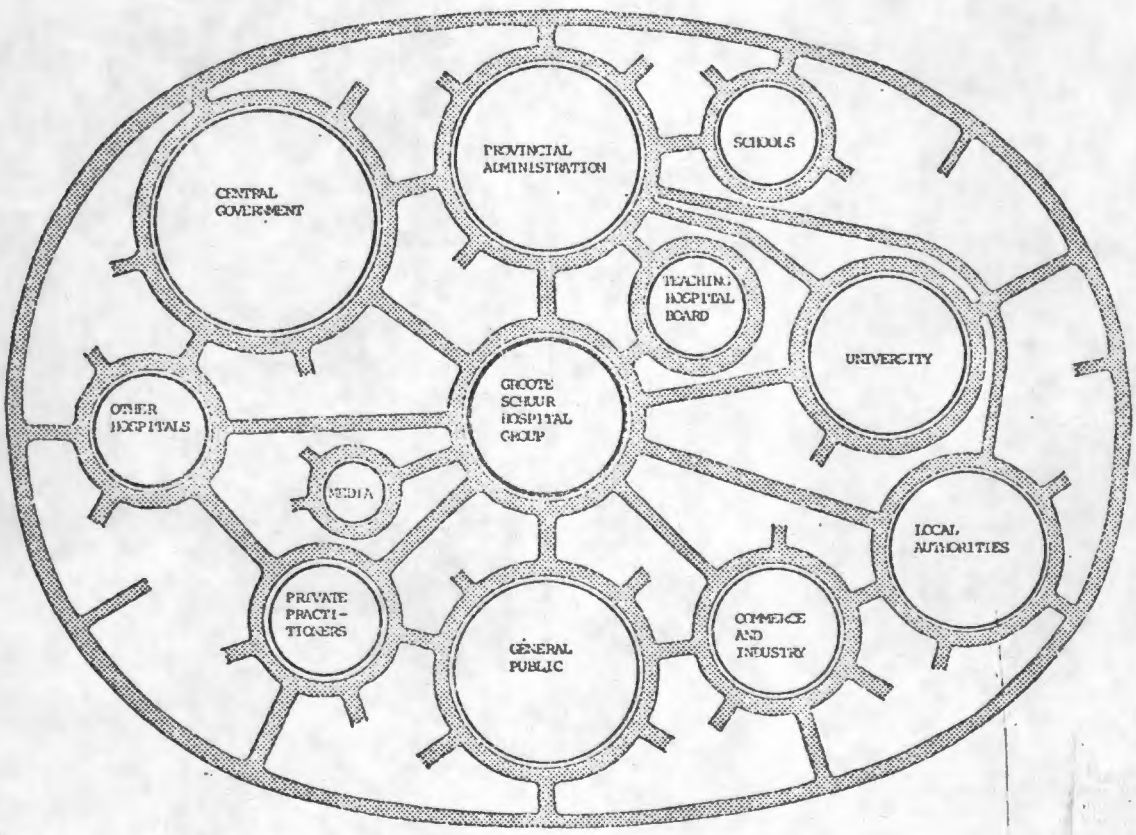


FIGURE 1.2 The Environment of the Hospital

Central and Provincial Government

The Hospital, which is a Provincial Hospital, does not fall directly under Central Government control but provides services in conjunction with several State and Local Authority Health Departments and its activities are directly affected by Governmental regulations and legislation and by various statutory bodies. Figure 1.3 indicates the responsibility of the State Health Department and the Department of Defence for provision of Health Services in South Africa and lists some of the more important organisations which interact with, control or monitor health services and health personnel.

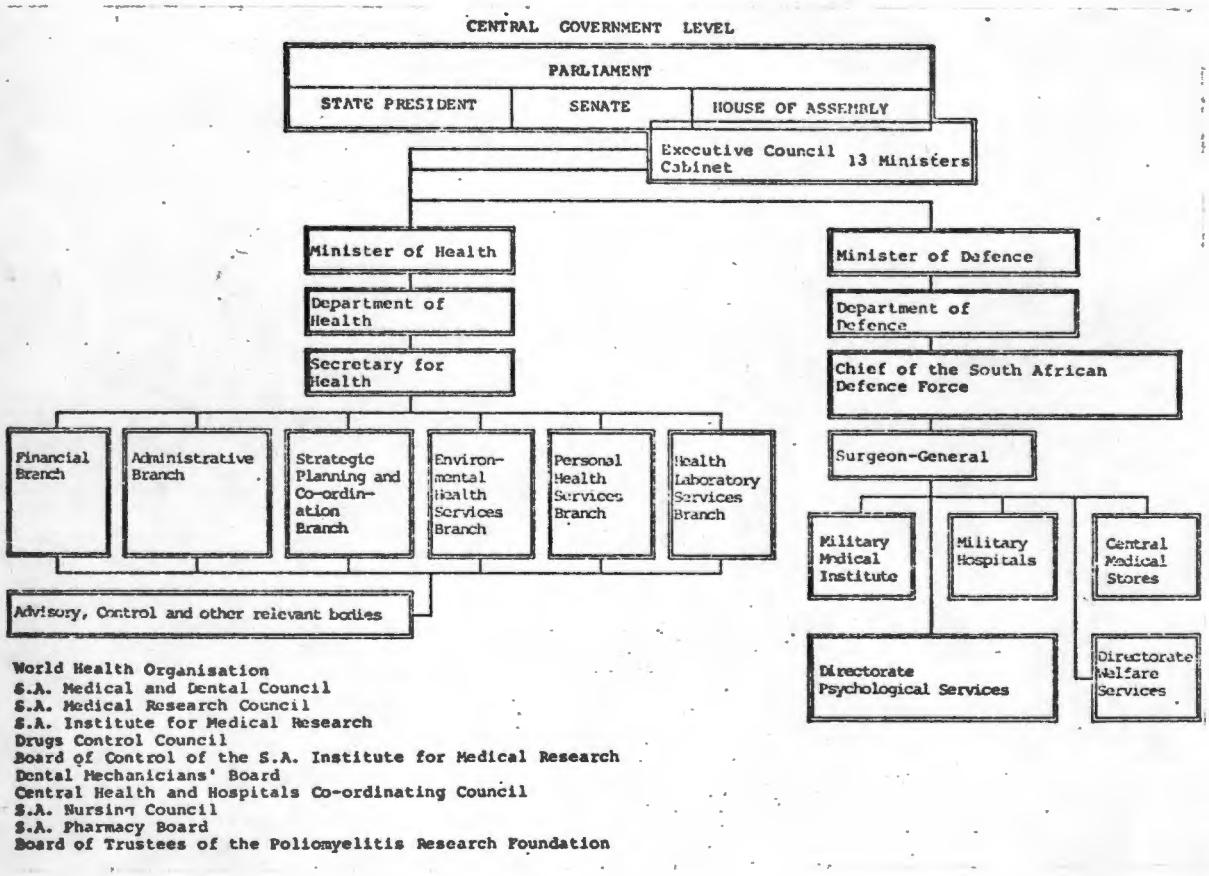


FIGURE 1.3 Organisation of Health Services at Central Government Level

SOURCE: J.J.N. Cloete, Administration of Health Services, (Pretoria: J.L. van Schaik, 1974), p.3

In South Africa, prior to Union, each colony or republic had promulgated health legislation--chiefly relating to Leprosy and Public Health.

> The (Cape) Colonial Parliament ..... legislated generously on medical matters. It showed itself competent to legislate for public health, for research and for the control of the medical profession and its ancillaries, and between 1879 and 1899 passed nineteen bills dealing with various aspects of medicine.[10]

Subsequently, when the Union of South Africa was constituted by the South Africa Act of 1909, it was explicitly stated that the Provincial Administrations would inherit the responsibility for hospital services.[11] The Public Health Act of 1919 concentrated on the functions and responsibilities of the newly formed Department of Health and those of Local Authorities, barely mentioning the Provincial Administration whose responsibility for curative health services was apparently accepted without question.[12] The resultant three-tiered structure of health authorities persists even in the most recent legislation--the 1977 Health Act.[13] The problems associated with this division of responsibility manifested at an early stage and many unsuccessful attempts were made to change the structure. The proposals made in the new Act to rectify the situation are discussed later in this chapter.

The relationship of the State Health Department to the Provincial Councils, Provincial Administrations and Hospital Services Departments, is illustrated in Figure 1.4 which clearly indicates the financial dependence of the Provinces and the control exercised by central governmental legislation and policy making.

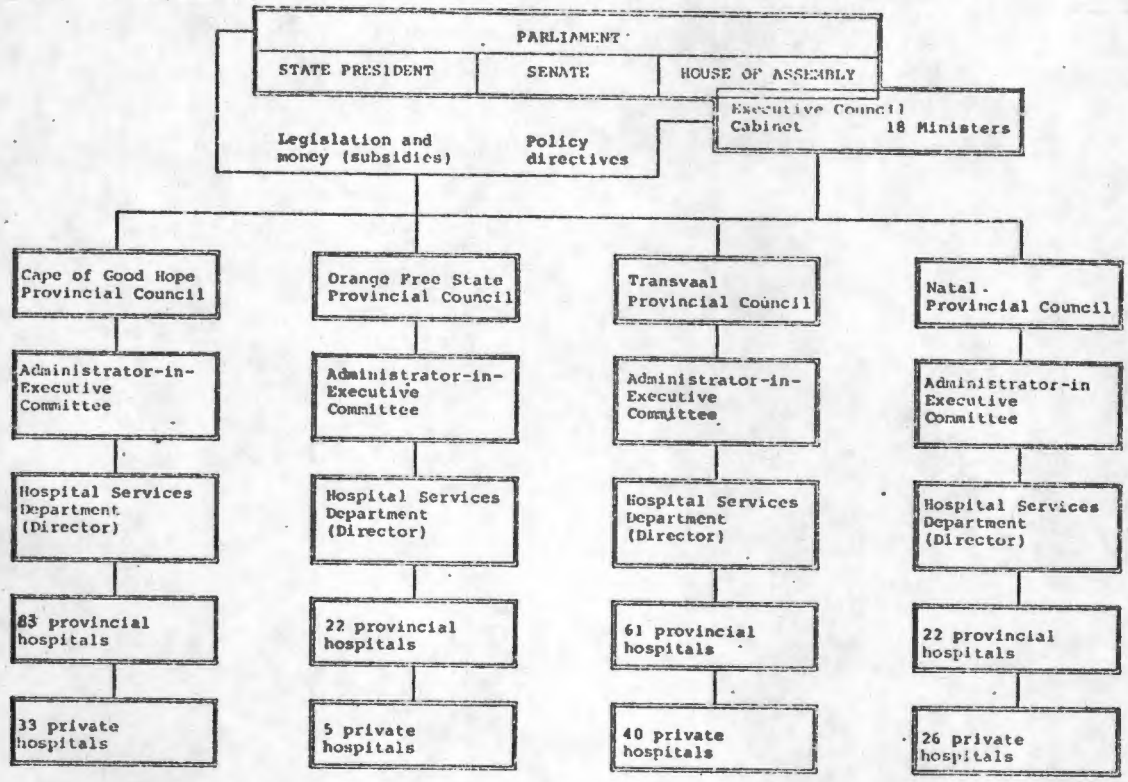


FIGURE 1.4 Relationship of Central Government to Provincial Governments and Hospital Services

SOURCE: Cloete, Administration of Health Services, p.9

Further elaboration of the structure of the Provincial Administration and the relationship of the Department of Hospital Services to other Provincial Departments is shown in Figure 1.5. These diagrams serve to illustrate the place of Groote Schuur Hospital in the country's Health Services as a sub-system of the Cape Provincial Hospital Service. The historical background to the administration of the hospital and its relationship to the Cape Hospital Board, the Hospitals Department and the University of Cape Town must now be described and the boundaries of Teaching Hospital defined.

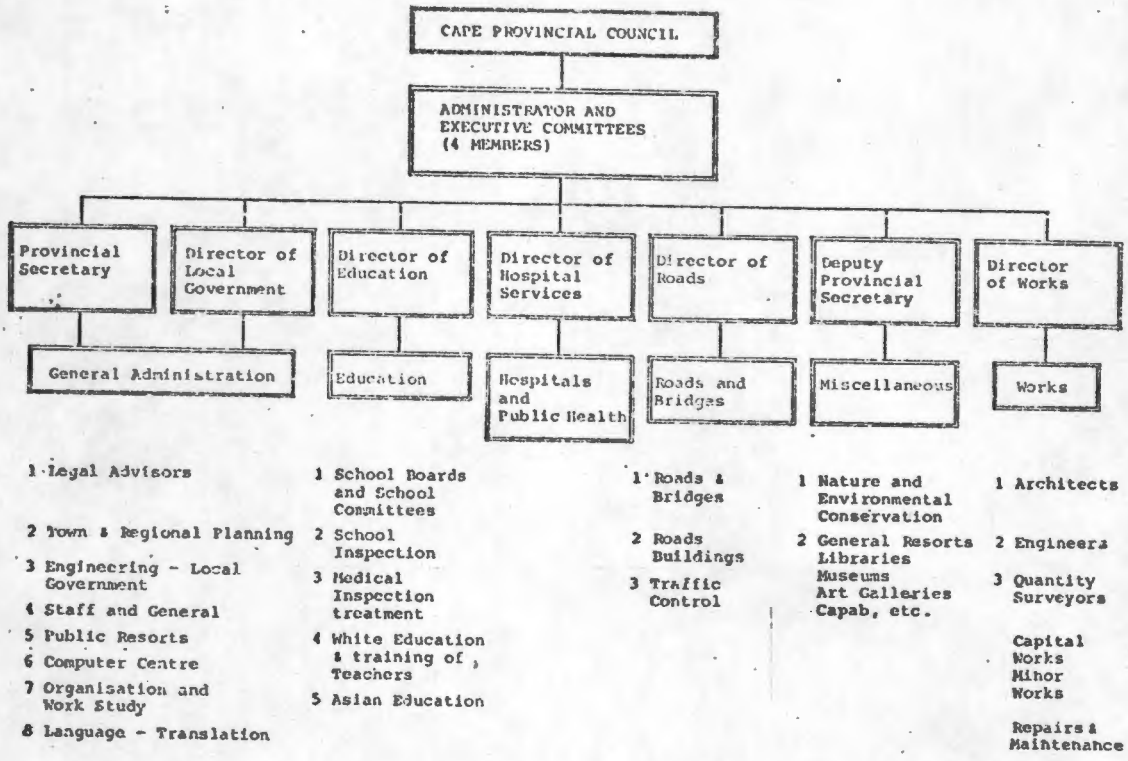


FIGURE 1.5 Structure of the Cape Provincial Administration

The Cape Hospital Board

A brief account of the development and origins of the Provincial responsibility for hospital services will enhance understanding of the relationship between Teaching Hospital and the many organisations in its environment which influence or participate in the activities of the hospital. The Four Provinces of the Cape of Good Hope, the Orange Free State, Natal and the Transvaal were created by the South Africa Act in 1910. Shortly thereafter, in 1912, the Cape Provincial Administration passed the Cape Hospital and Charitable Institutions Ordinance whereby Hospital Boards, subsidised by the Province, were to control and manage public hospitals.[14] The Cape Hospital Board continued to be responsible for the management of hospitals in the environs of the City of Cape Town (including from 1938 Groote Schuur Hospital) until 1946, when the Hospitals Ordinance of 1946[15] enabled the Provincial Administration to take over the direct control of all Provincial hospitals from the various Hospital Boards as from 1 January 1950.

The Boards remained in existence and retained certain responsibilities towards "their" hospitals including the administration of Board funds and the provision of patient and staff amenities--as well as duties of inspection and investigation of patients' complaints. The name of the Cape Hospital Board was changed in the course of time to the Teaching Hospital Board (Cape).

The Department of Hospital Services--Cape

The Hospitals Department which was created by the Hospitals Ordinance was placed in the charge of a Director of Hospital Services (who must be a medical practitioner) and has expanded rapidly since its inception thirty years ago. The Department is now directly responsible for eighty-three hospitals and budgeted for subsidies amounting to R5,612,000 to other Provincial-aided health institutions and mission hospitals in the 1976/1977 financial year.[16] In addition to hospital services, the Department finances and controls maternity and district nursing services and subsidises ambulance services throughout the Province.

Regionalisation - The Hospitals Amendment Ordinance 1972 empowered the Administrator of the Cape Province to

> classify Provincial Hospitals for administrative and other purposes in such manner as he may deem fit and may for such purposes classify Provincial Hospitals in groups in relation to regions designated by him.[17]

The amendment also allowed for the appointment of Regional Medical Superintendents and for the delegation of a considerable amount of responsibility to the Regional Medical Superintendent by the Director of Hospital Services.[18] Regionalisation and decentralisation were intended to make the administrative processes quicker and less cumbersome.
The Cape was divided into six regions.[19]
One for each major Academic Hospital.

1. Groote Schuur Hospital Region
2. Tygerberg Hospital Region
   and four other areas for the rest of the Province
3. Western Cape Region
4. Eastern Cape Region
5. Border Region
6. Northern Cape Region

The Groote Schuur Hospital Region as shown in Figure 1.6 consisted of--

The Groote Schuur Hospital Group

Groote Schuur Hospital
Peninsula Maternity Hospital
Mowbray Maternity Hospital
William Slater Hospital

Carinus Nursing College

The Provincial Blood Grouping Laboratory

The Red Cross War Memorial Childrens' Hospital and ancillaries

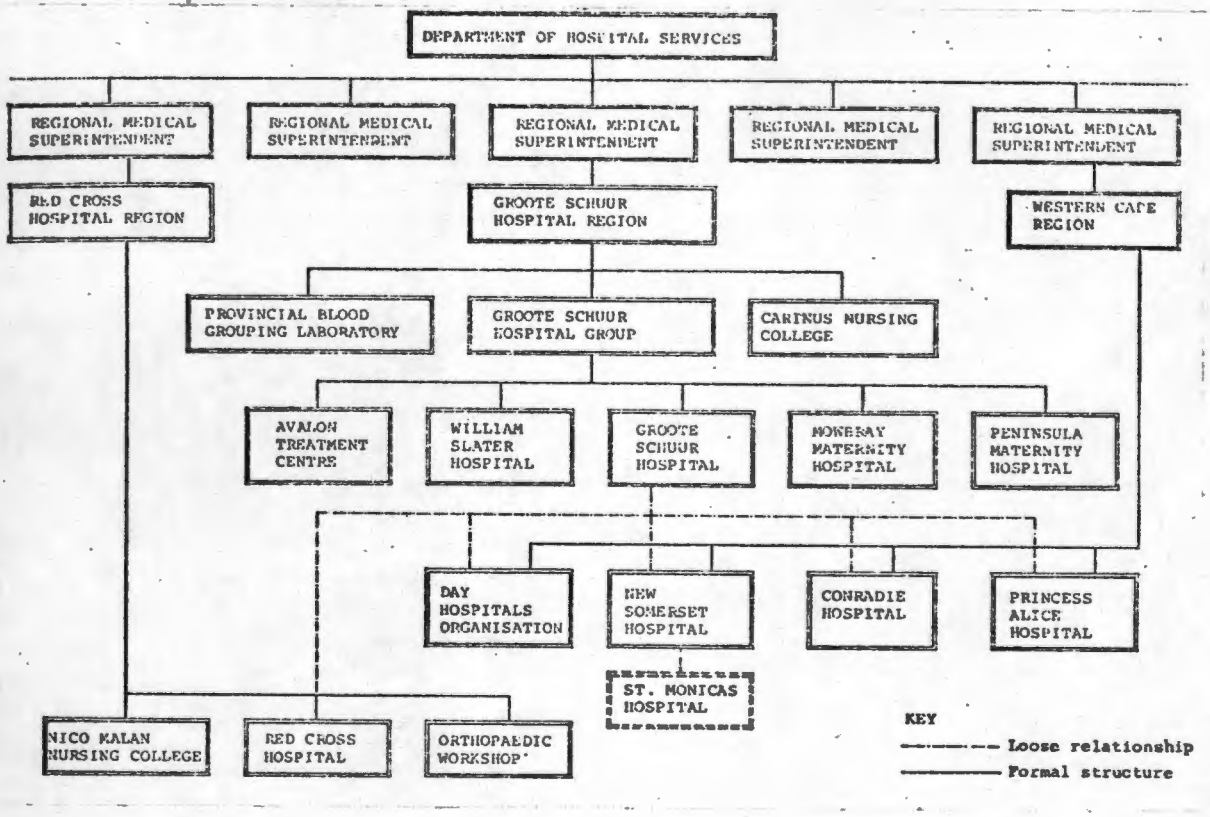


FIGURE 1.6 Regional Structure of the Cape Provincial Hospital Service

Carinus College and the Blood Grouping Laboratory are virtually autonomous and deal directly with the Department of Hospital Services in all matters of policy, purchase of equipment or creating and filling of posts. All administrative matters, requests for capital or minor works, payment of some salaries and accounts are dealt with by the Administrative section of Groote Schuur Hospital. Subsequently the Red Cross Childrens Hospital with its ancillaries was made an independent region and the Avalon Treatment Centre

opened in August 1976 as an addition to the Groote Schuur Hospital Group. There are several hospitals, as shown in Figure 1.6 belonging to the Western Cape Region, which are closely linked, by tradition and necessity, to the Groote Schuur Hospital Group and which have a number of "teaching beds" affiliated to the University of Cape Town Medical School.

The University of Cape Town

New Somerset Hospital was originally used as the training Hospital for the University of Cape Town Medical School. In 1938 Groote Schuur Hospital was opened and replaced the New Somerset Hospital as the primary locus for the training of medical students. From that time, until the Province assumed control and full financial responsibility for hospital services, the Cape Hospital Board maintained an excellent and supportive relationship with the medical school, within the constraints of limited finances, with much of the medical care being provided on an honorary basis by part-time medical consultants.

In 1948 the Government appointed the Brebner Commission to investigate the conduct of teaching hospitals and medical schools in South Africa.[20] Simultaneously the Administration of the Cape Province appointed a Committee of Inquiry into the Organisation and Administration of the Groote Schuur Hospital.[21] The recommendations from the two bodies were similar in many respects and dealt in detail with many aspects of hospital and medical school organisation, relationships, size and staffing.

As a direct result of the publication of these two reports an event of great significance took place. Almost immediately after assuming direct responsibility for the public hospitals in the Cape Province, the Administration entered into an agreement with the University of Cape Town which established a unique relationship between the Medical School and its teaching Hospitals. This Joint Agreement was signed in December 1951 and led to rapid growth of the hospitals concerned.[22]

Possibly the most important concept in the Agreement is acceptance by the University of responsibility for teaching and research and by the Provincial Administration for patient care in its widest sense. Professor John Brock, Emeritus Professor of Medicine, described the beneficial effects of the partnership thus -

> The most significant effect of this new system has been that men of high academic achievement and research potential are more frequently attracted into full-time appointment. There they can devote their thinking to the raising of standards and the advance of knowledge without the inevitable distractions of private practice. A real partnership between full-time and part-time staff has developed and brings mutual benefit. The influence of the part-time men prevents any tendency to the ivory-tower outlook and keeps the real and total needs of the patient in the forefront of attention. The presence of full-time men who are productive in research, constitutes a continual challenge to replace outworn concepts by new ideas. The joint effect on standards of medical practice has been remarkable.[23]

This agreement was reformulated in 1966 at which time the Provincial authority agreed to pay a greater proportion of the salaries of Joint Staff personnel and to provide accommodation for paramedical teaching departments, and supplies for the Joint Pathological Service.[24]

More recently a Tripartite Agreement has been signed by the State Health Department, the Cape Provincial Administration and the University of Cape Town. This document, identical in most respects with the Joint Agreement (1966), allows for provision of Psychiatric, Medico-legal and Community Health Services by State Health (direct financing) via the Provincial Hospitals, in conjunction with the University Faculty of Medicine--a very complicated arrangement fraught with administrative problems.[25] The intricacies of this network are shown in Figure 1.7

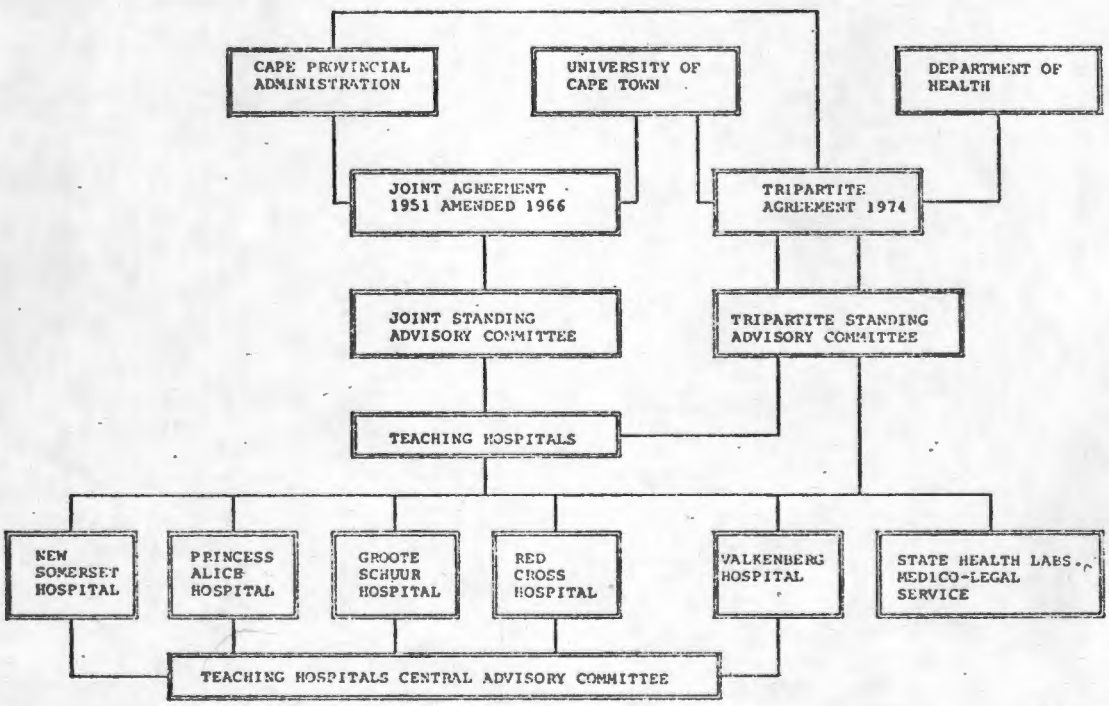


FIGURE 1.7 Joint Agreement (1966) and Tripartite Agreement

The Hospitals Ordinance and the Joint Agreement--form the framework for the organisation of the University of Cape Town Teaching Hospitals in the Cape Province. In addition, there is a substantial body of other legislation which also affects the administration of Groote Schuur Hospital.

Legislation affecting Health Services and Hospitals

Legislation affecting medical and health matters progressively formalised the unstructured early growth of health care throughout the country, reflecting the three-tiered structure of Government which exists in South Africa. The 1918 'flu epidemic was the initial galvanic stimulus to the South African Government to accept some responsibility for the public health. The Public Health Act of 1919 was the first comprehensive, legislative measure on health services for the Union of South Africa, although the prevention of epidemic disease had been regarded as the responsibility of the Central Government from the time of Union.[26] This act set up a separate Department of Health--the previous custodian having been the Department of the Interior. Increasing numbers of Acts and amendments to Acts followed, resulting in a system which now controls the provision of health (including mental health) care at all levels; the registration and practice of all medical and nursing and most paramedical personnel; the manufacture, sale and dispensing of medicines; the use and disposal of human bodies and their products; as well as research into environmental, occupational, education and welfare factors affecting the nation's health. A comprehensive review of health and related legislation has recently been published by Schwär and Smith which is an indispensable vade mecum for all health administrators and doctors, defining clearly the statutory and ethical obligations, knowledge of which is absolutely essential for medical practice and hospital management.[27]

In addition--legislation and regulations concerning motor vehicle accidents, labour regulations, and a multitude of other general laws and regulations must be taken into account in managing hospitals and planning services for patients.

The Health Act 1977

The most significant recent legislation affecting health services and hospitals is the Health Act 1977, which repealed many of the existing health and health related regulations, laws and amendments--dating back to 1884. Changes effected by the 1977 Health Act will result from better co-ordination of Health Services, clearer definition of the responsibilities of the three

Health authorities, the effectiveness of the Health Matters Advisory Committee in realistically assessing community needs and the ability of the Health Policy Council to determine rational policy.[28] Dr J.P. Roux, Director of Personal Health Services in the Department of Health believes that these changes will be beneficial -

> In place of the rigidity of the existing health legislation a more flexible pattern is envisaged in which the powers, functions and duties of all the different authorities are reflected. Provision is also made for the co-ordination of services and the determining of health policy on a national basis, so that the functions and duties of the different health authorities could be adapted to utilise available resources to the maximum, making the most effective health service available to the public.[29]

The most important features of the Act are illustrated in Figure 1.8.

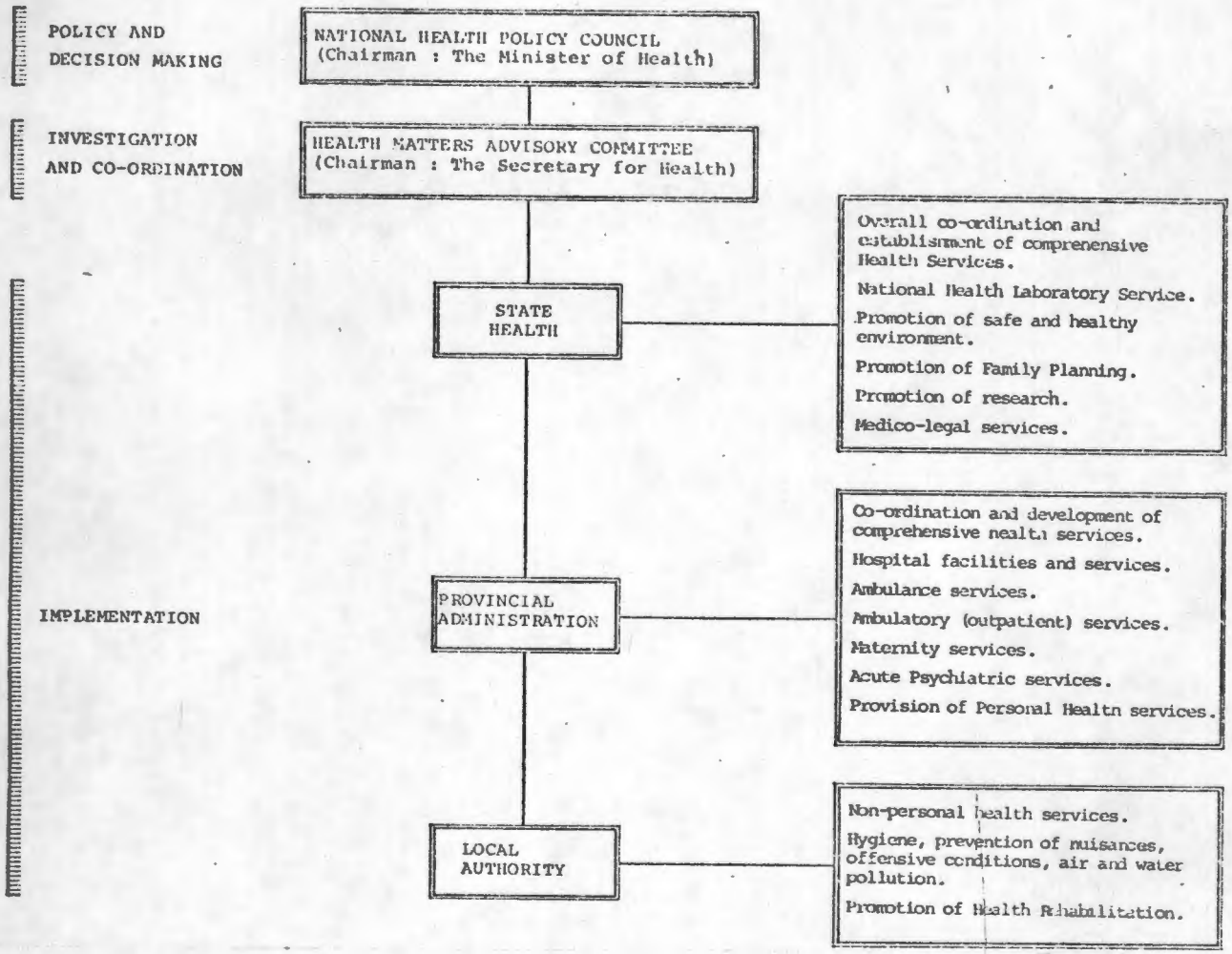


FIGURE 1.8 Functions of Various Bodies and Health Authorities in terms of the Health Act 1977

Dr. Johan de Beer, Secretary for Health, in outlining the practical applications of the Act emphasised the promotive and preventive aspects of health service provision and the necessity for developing norms--for needs and services. The importance of the development of Community Health Services and Centres and of reviewing and revising current hospital planning policy is stressed.[30] He also emphasised, as does Dr. Roux, the significant change in status of the new executive National Health Policy Council as compared with its predecessor the Central Health Services and Hospital Co-ordinating Council, which could only act in an advisory capacity to its own Chairman and had no executive function.[31] The Act does not clearly state that community participation in health-service decision-making is an intention of the Act as claimed by Roux and de Beer.[32] If this is the intention it is praiseworthy but unlikely to succeed, as the predominance of medical and other health professionals on the advisory sub-committee as constituted, will undoubtedly smother the small public voice.

Application of the Health Act 1977 to Provincial Hospitals

The implications of the 1977 Health Act for Provincial Hospitals are unclear. It is anticipated by some health administrators that hospitals will become the centre of regional health services--controlling, directing and organising peripheral clinics, long-term care facilities, home-care, health education programmes and the other multitudinous activities of preventive, promotive, curative and rehabilitative health care. The other view, supported by de Beer, believes that hospitals of all kinds--contrary to tradition--

> should invariably be designed in support of the needs of the health centres rendering primary health care at the peripheral level, and not vice versa (original emphasis)[33]

Hospital-centred health services have been criticised as concentrating on curative, costly medicine rather than relatively inexpensive, preventive services and as being doctor--rather than patient-oriented. Leininger suggests that future health service planning should provide for Primary care services quite independently of hospitals--including

1. Short-term ambulatory care
2. Long-term ambulatory care
3. Crisis intervention
4. Health Education and other Promotive services
5. Preventive services
6. Self help/care services
7. Family Care Clinics--including Family Planning
8. "Worried-Person" Clinics--physical and mental health

and that these should form the basis of health care--related to community needs, easily accessible and convenient, providing continuity of care, prevention of illness and disability at reduced cost with maximal utilisation of resources.[34]

At present the boundaries of Groote Schuur Hospital encompass the hospitals in the Group, a substantial portion of the affiliated Medical School, certain Community Services (particularly psychiatric and obstetric) and medical and technical services to other centres in the Cape Province. Hospital personnel function in a wider range of health services, hospitals and other activities through University links and professional associations--with ripple effects into academic, political, welfare and other social spheres. To a limited extent Groote Schuur Hospital is already involved in Leininger's Primary Services in the Community--but these are fringe activities, peripheral to the hospital's main functions. Extensive participation in preventive health care is still beyond Groote Schuur's boundary although the distinctions are no longer clear cut, nor has the hospital's future role under the new Health Act been determined.

Other Hospitals and Health Institutions

Until such time as the ramifications of the 1977 legislation have been clarified, the co-operation and liaison between Groote Schuur Hospital and other Provincial health services will continue to develop and expand. The Group provide a professional and/or technical service for many of the other Provincial hospitals in the Peninsula and in other areas of the Cape Province--particularly in Port Elizabeth, East London and the Ciskei. Other regions are affiliated to Tygerberg Hospital and the Stellenbosch Medical Faculty. Through the Medical School there is a close link with the Medical Research Council which supports several important Research projects run by members of the Joint Staff.

Local Authority health services work in close collaboration with the Group both through maternal and child welfare clinics and in the prevention and control of infectious diseases. Liaison with State Health Services--mental health, family planning and Community and Comprehensive Health--is assured in terms of the Tripartite Agreement and no serious conflict has yet arisen as a result of shared staff and services. Valkenberg Mental Hospital is the major participant in terms of staff utilisation and size and is now an integral part of the Psychiatric teaching unit.

There is minimal interaction between the private acute hospitals and the Group, but considerable 'traffic' takes place between the long-term institutions such as old-age homes and nursing homes, with mutual interdependence and support. It is apparent that no organisation can stand alone in providing health care and that effective collaboration and good liaison is essential between all the facilities to enable each to function most effectively.

The Other Participants

Several important organisations which participate in the activities of the Groote Schuur Hospital Group and their relationship with the hospital have been discussed. As shown in Figure 1.2, however, there are many other bodies which also interact with the hospital. It is not possible to analyse these all in detail but the more influential ones require some elaboration.

Professional Councils and Associations

Several statutory bodies control the training, registration, employment, conduct and ethics of the Medical, Paramedical, Social Worker and Nursing employees at all hospitals.

The South African Medical and Dental Council controls all medical and dental practitioners and maintains a register of specialists. Professional Boards for ten paramedical disciplines are affiliated to the Council and registration is essential for practitioners in these disciplines. Several other categories of ancillary health personnel are also registerable with the Council.

The South African Nursing Council controls training, certification and conduct of all nursing personnel and the Nursing Association promotes and protects the interests of the Nursing profession. A new Nursing Bill is before Parliament which still requires that nurses be registered with both the S.A. Nursing Council and the S.A. Nursing Association but permits the Association to operate independently of the Council.[35]

Social Workers must be registered with the National Welfare Board at present. New Legislation, The Social and Associated Workers Bill is proposed, which will establish a Council for Social and Associated Workers.[36] The objects of the Bill are to control training, standards, ethics, and to promote the interests of the profession and provides for compulsory registration of all Social and Associated Workers.

The Councils act in an advisory capacity to the Central Government and control large numbers of hospital employees. Approximately 52% of the staff in the Groote Schuur Hospital Group--medical, paramedical, social workers and nurses--are subject to the requirements of these Councils and Boards which impose strict controls on the employer as well as the employee. The conflict which may result from these employees identifying with their profession, rather than with the employing organisation, is discussed in a later chapter.

In addition to the Councils there are numerous professional organisations which act as watchdogs of members' interest by forming more or less powerful lobbies. The Medical Association of South Africa is the most active and influential of these groups, which constantly strives to improve the status, remuneration and working conditions of its members.

Society

The community served by the hospital is obviously one of the major participants in its activities--not only as patients and visitors but also as voters, workers, benefactors and recipients, in a wide sense, of the benefits derived from the hospital--trained health personnel, advances in knowledge, maintenance of health and welfare, health education, employment and other societal gains.

The question of community participation in planning of health services has become a very active issue in other countries and the power of the community--either as voters or as pluralistic pressure groups has received much attention from sociologists.[37] Although there is little evidence as yet of increasing consumer interest in decision-making in health service or hospital planning in South Africa, the situation described by Hofman in the United States will probably develop in this country in the future.

> Although in the past the unique historical development of our pluralistic system has tended to diffuse the impact of social and political pressures on the health care environment, the industry is no longer as immune to such influences... As the mystique surrounding medicine continues to diminish in scope and magnitude, patients are becoming more assertive in contrast to their once passive posture.[38]

As stated earlier, Roux considers that the 1977 Health Act will provide an avenue for Community participation. This is questioned--but certainly provision should be made for such participation. At the higher levels, in the Health Matters Advisory sub-committees, it is hoped that public participation will be made possible. At the hospital level it is thought that Hospital

Boards could play a more active role as consumer representatives and this possibility is discussed in a later chapter on the hospital's product.

Many other organisations--local authority, voluntary services and welfare organisations form part of the hospital's environment, as do the Press, and commercial and industrial enterprises which supply the goods which enable the hospital to function. Relationships with the Press have improved since the appointment of a press cum public relations officer for the Group. The undoubted power of the media does not, however, appear to influence hospital policy-making to any great extent, at the present time. Conflict between hospitals and the news-hungry press is unavoidable in the light of their conflicting goals and values. Hospitals are bound by an ethical code which demands privacy, confidentiality and protection of patients' interests. The press believes the public has a 'right to know', seeks exposures and revelations and abhors secrecy and protected information. Medicine and the media are incompatible bed-fellows.

The Pharmaceutical and Medical Supplies and Equipment Industries

There has been intensive investigation and much discussion in recent years on the role of health and medical care-allied industries in contributing to the steeply escalating costs of health care.[39]

The Pharmaceutical industry in the United States is controlled by the Federal Drug Act and is a very 'visible' business. The profitability of the industry has been severely criticised.
According to Goddard -

> Drug companies regularly show a return of 18% which is two-thirds higher than the average rate of return for all manufacturing concerns in the decade 1960-1970.[40]

This is endorsed by Doherty who shows that for virtually the whole period from 1956-1971 the drug industry was the most profitable industry in the United States.[41] This is achieved despite massive expenditure on marketing--four times greater than research and development costs, as shown in Figure 1.9, which is an estimated breakdown of the components of drug costs for 17 leading pharmaceutical manufacturers in 1967.[42]

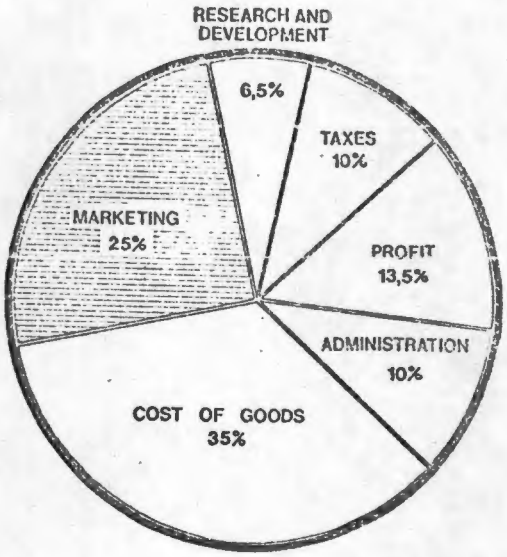


FIGURE 1.9 Breakdown of Sales Dollar--Contributory Cost Components.
SOURCE: Goddard, "The Medical Business" p.165

The Pharmaceutical industry is obviously extremely efficient and has contributed greatly to man's fight against disease, managing at the same time to provide a most satisfactory investment for the shareholders.

Factors which favour pharmaceutical profitability include the widespread use of trade names for prescribing, which, because of patents leads to monopolistic power and limits the effect of competition in the industry, and the susceptibility of doctors to high powered salesmanship, which favours excessive expenditure on advertising and marketing--and increases unnecessary differentiation of drugs. It is estimated that only five or six out of forty new products marketed each year (USA) are real improvements on existing drugs.[43]

The Snyman Commission into the High cost of Medical Services and Medicines, reporting in 1962, found that there were no excessive profit margins or profits earned by the South African pharmaceutical industry at any level--production, wholesale or retail. The Commission severely criticised the industry's advertising practices but left control to the companies themselves. Several recommendations were made regarding the use of generic names for medicines in preference to trade names, and to limiting patent rights to a period of five years.[44]

The Sainsbury Committee investigated the Pharmaceutical Industry in the U.K. in the period 1965-1967 and recommended inter alia, that visits to doctors by representatives of drug firms should be banned and that advertising in

medical journals should be stopped.[45] This has not proved possible but many countries are attempting to curb the drug industry's wilder excesses and to ensure that new medicines are a) effective and b) safe before they are marketed.

It is clear that responsibility for excessive drug costs, drug misuse and unwarranted consumption can be laid at the door of both the pharmaceutical industry and the medical profession. In hospitals, responsibility rests with management to ensure that drugs are dispensed by generic not brand names, and that doctors are encouraged to prescribe rationally. It is anticipated that computerised pharmacy systems will aid physicians and pharmacists in controlling drug use, drug interactions and costs.

The Medical Supplies and Equipment Industries have not as yet been subjected to the same glaring scrutiny as the drug companies. It has been suggested that a similar situation is developing--or has already developed with these manufacturers and suppliers, where disproportionate amounts are spent on marketing, insufficient control is exercised over the quality and safety of the many products on the market and enormous commercial pressure is put upon doctors and hospitals to buy the newest, discard or upgrade the old and to commit large sums of money to expensive and often inadequately tested equipment.

The sales of consumable supplies in the U.S.A. are expected to reach $4,2 billion by 1980--from $2,0 billion in 1972. It is estimated that sales of laboratory equipment will increase from $200 million in 1968 to $570 million in 1980.[46]

Groote Schuur Hospital is of course subject to these international trends--as a consumer in a country which is unable to alter or influence the behaviour of manufacturers in distant countries. Drug and equipment firms in the Republic are for the most part, subsidiaries of, or agents for, the multinational companies which dominate the health-care market worldwide. Controls of one kind or another are being imposed in the developed nations, where ways and means of reducing monopolistic practices and controlling exaggerated advertising by the pharmaceutical industry are being sought. It has been suggested that the World Health Organisation should accept responsibility for guiding and helping developing countries to control patents, manufacture, quality, marketing, and advertising of pharmaceuticals.[47]

Controls which are exercised in-house at Groote Schuur Hospital include--providing doctors with information on comparative schedules of costs of similar preparations; restriction on availability of drugs; purchasing by tender of the

least expensive, effective version of drugs; insistence on generic name prescribing and permitting the pharmacists to substitute equivalent drugs for those actually prescribed. There has been a marked diminution in the volume of advertising material and free gifts to medical practitioners in recent years and it is possible that in one area at least, the industry is being tamed. The same cannot be said for other medical businesses--particularly in regard to disposable goods and equipment. Intensive investigation is required into these industries as regards overpricing and high profitability --much as was done during the 60's with the drug companies. The individual hospital, swept along on the current of rising costs, high-pressure salesmanship and increasingly sophisticated technology, is unable to resist the tide unaided.

SUMMARY

Hospitals have developed over the centuries into extremely complex organisations. In attempting to understand and improve their function, open systems theory has been applied to the analysis and management of these institutions. The systems approach is used to study the organisation of hospitals in the South African context, using Groote Schuur Hospital as a model. Groote Schuur Hospital's environment includes the supersystem of which the hospital is a component--the Health Services at all levels--State, Provincial and Local Authority; the Cape Provincial Administration, the Department of Hospital Services and the University. Other environmental participants are various Statutory Councils and Boards, professional organisations, the larger society and all its components, including commerce and industry. The Hospital Ordinance and the Joint Agreement (1966) are the cornerstones of the hospital's structure. There is a voluminous body of legislation and regulations affecting every aspect of hospital administration--most significantly the new Health Act 1977. The effect which this Act will have on hospital services has not yet been clarified and the consequences for Teaching Hospital can only be hazarded.

It is considered likely that in the future the community will become more vocal in stating its requirements of health services--and that greater control will be exercised internationally over the various health service suppliers, as a result of public pressure to contain costs of medical care.

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2. RESOURCE INPUTS - MONEY AND INFLUENCE

The basis of open systems thinking is the input-conversion--output model, where the inputs may come from the external environment or from within the enterprise itself. As applied to organisations, the major inputs are information, influence, legal and social restraints and resources (see Figure 1.1). The latter comprising money, people (with their knowledge, skills and talents), equipment, buildings and plant are the predominant concern of the next four chapters. No distinction will be made between environmental and internal inputs as there is considerable overlap between the two, with constant recycling of input and output--both of people--personnel and patients and, to a lesser extent of money. Resource inputs will, therefore, be examined in three main categories regardless of origin.

1. Financial - with limited discussion on the relationship between money and influence.
2. Human - Personnel and their management, including the effects of specialisation, professionalism and bureaucratisation.
3. Material - Buildings, Plant, Equipment and Supplies.

Analysis of the inputs to a hospital immediately brings the patient to the forefront.[1] The patient is also, however, one of the hospital's chief outputs and, in many cases, a recurrent input. A sociological analysis of patients is beyond the scope of this work, as are demographical and epidemiological surveys of the ages, races, sexes, origins, occupations, social class, cultural backgrounds and diseases of the patients treated at Groote Schuur Hospital. This work will concentrate on the management and processing of resources and will consider the patient as a product or output of the system rather than as an input. Patients are not a resource and it is, therefore, logical to exclude them from this analysis, the primary intention of which is to examine resource inputs and their utilisation.

The single most important resource in hospital terms is money--which purchases and makes available the other--human and material resources--and is therefore given priority in considering Groote Schuur Hospital's inputs.

The whole process of financial management, from acquiring funds to auditing expenditure, can be considered as the hospital's financial input, as this process initiates all other activity within the organisation. Money is fundamental to the hospital's existence.

MONETARY INPUTS

Groote Schuur Hospital is a Provincial Hospital--totally dependent on the Cape Provincial Administration (CPA) for financial support--receiving 99,9% of its financial input from this source and only about 0,1% from the Teaching Hospital Board. All money earned by the hospital from fees, board and lodging, meals and sale of condemned equipment is paid directly to the Provincial Revenue Fund. Payment from the University of Cape Town (UCT) for teaching of medical students by medical and technical staff, and for use of laboratory materials by students[2], is refunded to the Hospital account as are repayments from State Health, Medical Research Council and other bodies whose employees work in the Groote Schuur Hospital Group.

Financial Input (1976/77 Financial Year)--Groote Schuur Hospital Group

Cape Provincial Administration	R40 567 000
Teaching Hospital Board (Cape)	R 52 000
UCT Refund for Teaching Time etc.	R 293 000

Receipts (1976/77 Financial Year--Groote Schuur Hospital Group (paid into Provincial Revenue Funds)

Fees, Board and lodging, sale of equipment etc.	R 2 141 000

Provincial Revenue

The Province, in turn, is heavily dependent on subsidies and grants from the Central Government. Approximately 65% of Provincial Revenue is funded as subsidy from the Central Government and another 17% as grants, loans or special allocations from Treasury or from other Government departments such as the South African Railways. 82% of Provincial Revenue is provided in one way or another, directly or indirectly, via the Treasury. The remaining 18% is derived from taxation and departmental receipts--secretariat, education, hospitals and roads.[3]

In the financial year 1976/77 the Cape Provincial Administration estimated that R195 097 000 would be spent on Hospital Services and Public Health. Of this amount, the sum of R40 567 000 allocated to the Groote Schuur Hospital Group, represents 1/5 of the total expenditure on Hospital Services and Public Health for the whole of the Cape Province and does not include funds spent on buildings--neither capital or minor new works nor repairs and maintenance--most of which is paid for by the Department of Works from their annual allocation. The costs of hospital buildings and the effects of rising building costs will be considered in Chapter 5. Another cost which is borne directly by the Hospitals Department and is not reflected in individual hospital's budgets, is the Provincial subsidy to Pension, Provident and Medical Aid funds, which amounted to R9 475 000 for all employees in the Cape Hospitals Service in the 1976/77 financial year.[4]

Teaching Hospital Board Funds

As stated previously, the Cape Hospital Board (now the Teaching Hospital Board) was given certain responsibilities, duties and privileges by the Hospitals Ordinance No. 18 of 1946 and is entitled

> for special purposes approved by the Administration in connection with the hospital or hospitals for which it is appointed, (to) collect subscriptions and accept bequests, donations or gifts, and receive the subsidy, payable under Section 46, provided that arrangements, approved by the Administration are made for the banking of, accounting for and disposing of all monies so collected, accepted or received.[5]

and to "accept and administer trusts for hospital purposes".[6]

Research Funds

Financing for research comes from a variety of sources, including the Medical Research Council. These funds are administered directly by Departmental Heads via the University or are allocated by a committee of the Faculty of Medicine, and cannot be considered as part of Teaching Hospital's income. The benefit to patients of this money, through direct application to clinical services or research outcomes, is considerable. It is, therefore, important to note this contribution although information on the amounts of such funds was not obtainable.

GROOTE SCHUUR HOSPITAL GROUP COSTS

Analysis of Groote Schuur Hospital's expenditure is complicated by the widespread network of services--particularly medical, technical and administrative--which are provided for the whole Group and for other hospitals and organisations in the Cape Peninsula and elsewhere in the Province. Although four of the five hospitals in the Group have separate budgets for control purposes, all the administrative support is provided by Teaching Hospital including -

Personnel	- Payment of salaries, leave records, appointments, promotions, transfers, terminations, housing subsidy, pensions and medical-aid etc.
Supplies	- Tendering, ordering, storage, distribution.
Accounts payable	- Payment of merchants and other accounts.
Accounts receivable	- Fees (rendering accounts to patients for services rendered)
Finance	- Budgeting, costing, auditing.

All medical, paramedical, technical and administrative staff salaries for the Group are paid by Groote Schuur Hospital, including all registrars' salaries (250 posts) for all hospitals covered by the Joint Agreement (see Figure 1.7). In addition, laboratory services for several other Peninsula hospitals are provided free of charge by Groote Schuur Hospital. (Note: Registrars are qualified doctors undergoing additional training in order to specialise.)

These expenses which are to Groote Schuur Hospital's account--for services supplied in other institutions cannot be accurately quantified for the following reasons.

1. Administrative services for the four other hospitals in the Group are integral to the function of personnel serving Groote Schuur Hospital as well. There is no constant or consistent division of labour by service to another unit. Time spent on work done for the other institutions is not recorded--nor is there a practical need for such separation of labour costs.

2. Partial quantification of registrars' services to other hospitals is possible but would not be accurate, as registrars may be on call for several units covering Groote Schuur Hospital itself, other hospitals in the Group, or other hospitals affiliated to the Medical School. Registrars' time is divided between clinical service, teaching, research and study but the allocation is not precisely determined or consistently followed and cannot be costed.

3. The volume of laboratory services for other institutions is not recorded nor have the costs been assessed for individual tests.

4. Other services which fall under the Tripartite Agreement are partially refunded by the Department of Health--including salaries of psychiatrists, psychiatric registrars and psychologists--and of medical personnel in Community and Comprehensive Health. All family planning expenses are paid for by the Department of Health, including the cost of cytology investigations for all Family Planning clinics in the Southern Peninsula, but it has proved impossible to extract these amounts from the records.

In view of these inextricably complex payments and repayments, all the aforementioned will be ignored and for the purposes of this discussion the total budget for the Groote Schuur Hospital Group and all expenditure and activities for the whole Group will be dealt with as if for one hospital.

Carinus Nursing College and the Blood Grouping Laboratory expenses are omitted as these are not included in the budget or financial statements for the Group and minimal cost is involved in providing services to these institutions compared with total expenditure.

Increasing Activity and Rising Costs

In Figure 2.1 the percentage increases in patient day costs (adjusted), personnel costs (adjusted) and adjusted patient days[7] for the Teaching Hospital Group are compared with the Consumer Price Index (CPI)[8] for the period 1968/1976. This shows a disproportionate rise in costs of hospital care (191%) accompanied by a 52% increase in the number of personnel employed and a less marked expansion of activities (adjusted patient days--28,7%). Change in complexity, quantity of services offered or improvement in quality of care provided, are not reflected and the means for doing so have not been devised. It is, of course, possible to list the changes which have taken place in the hospital in the same nine year period--opening of intensive care units, institution and

development of dialysis and renal transplant programmes, rapid expansion of open heart surgery and other high technology therapies--but without quantification and a basis for comparison, this does not provide justification for the steep rise in costs.

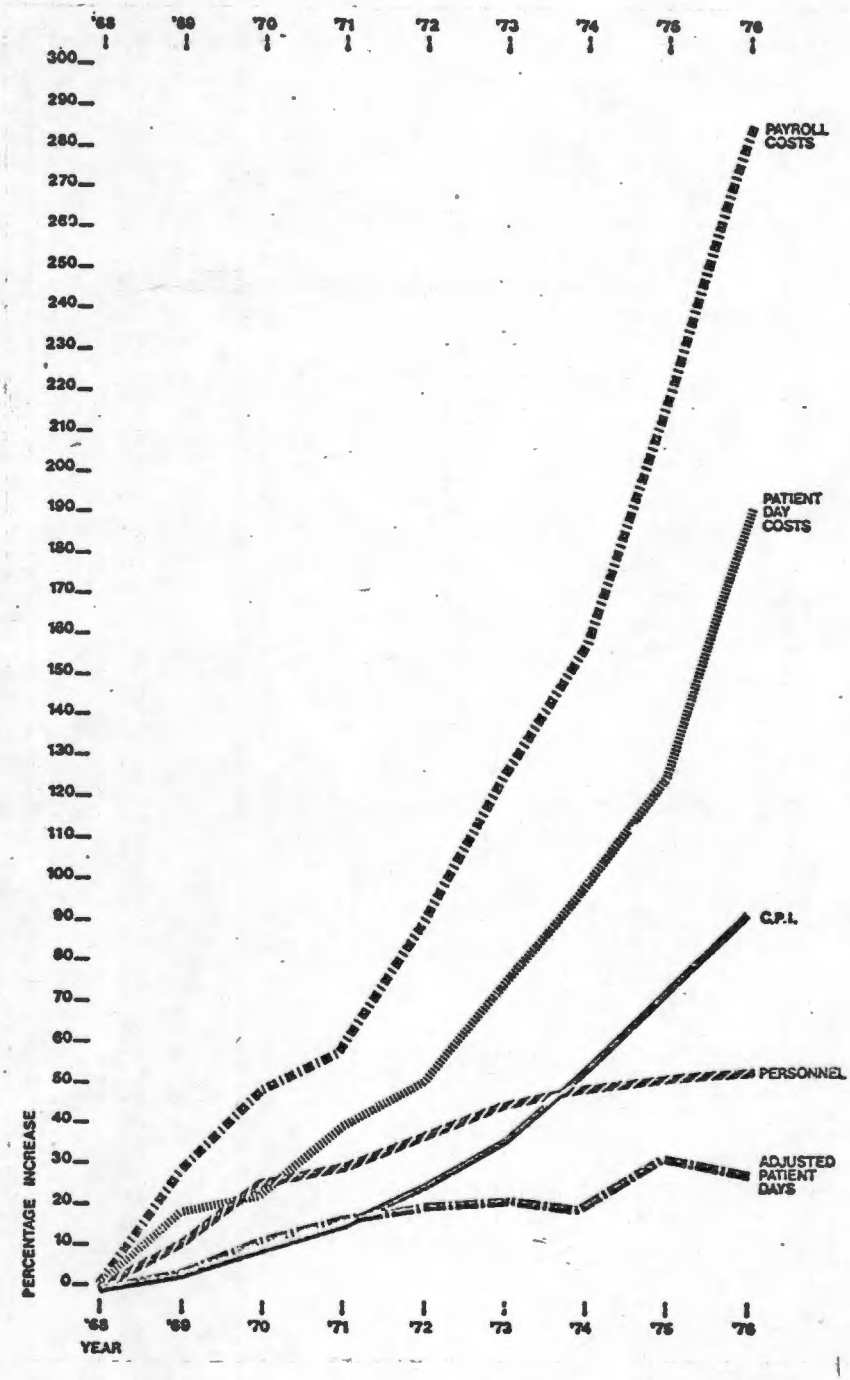

FIGURE 2.1 Groote Schuur Hospital Group: Percentage increases in patient day costs, adjusted patient days, payroll costs, personnel numbers and the Consumer Price Index (C.P.I.) 1968-1976 (All costs adjusted to base 100 = 1970)

Figures on unadjusted patient day costs for some of the other teaching hospitals in the Republic are shown in Figure 2.2.[9] The two hospitals with the lowest costs are those which treat black patients only. The two hospitals with the highest costs are those which treat white patients only. The three hospitals with intermediate costs treat all races. (See note at foot of Figure 2.2 re H.F. Verwoerd). The costs for Groote Schuur Hospital have risen proportionately less than those for the white or other multiracial hospitals. It is felt, however, that for many reasons these figures are not truly comparable--the major factors being the differential salary scales between white and non-white professional, technical and nursing staff salaries and the lack of information on how many 'outside' services are included in the costs for the other hospitals.

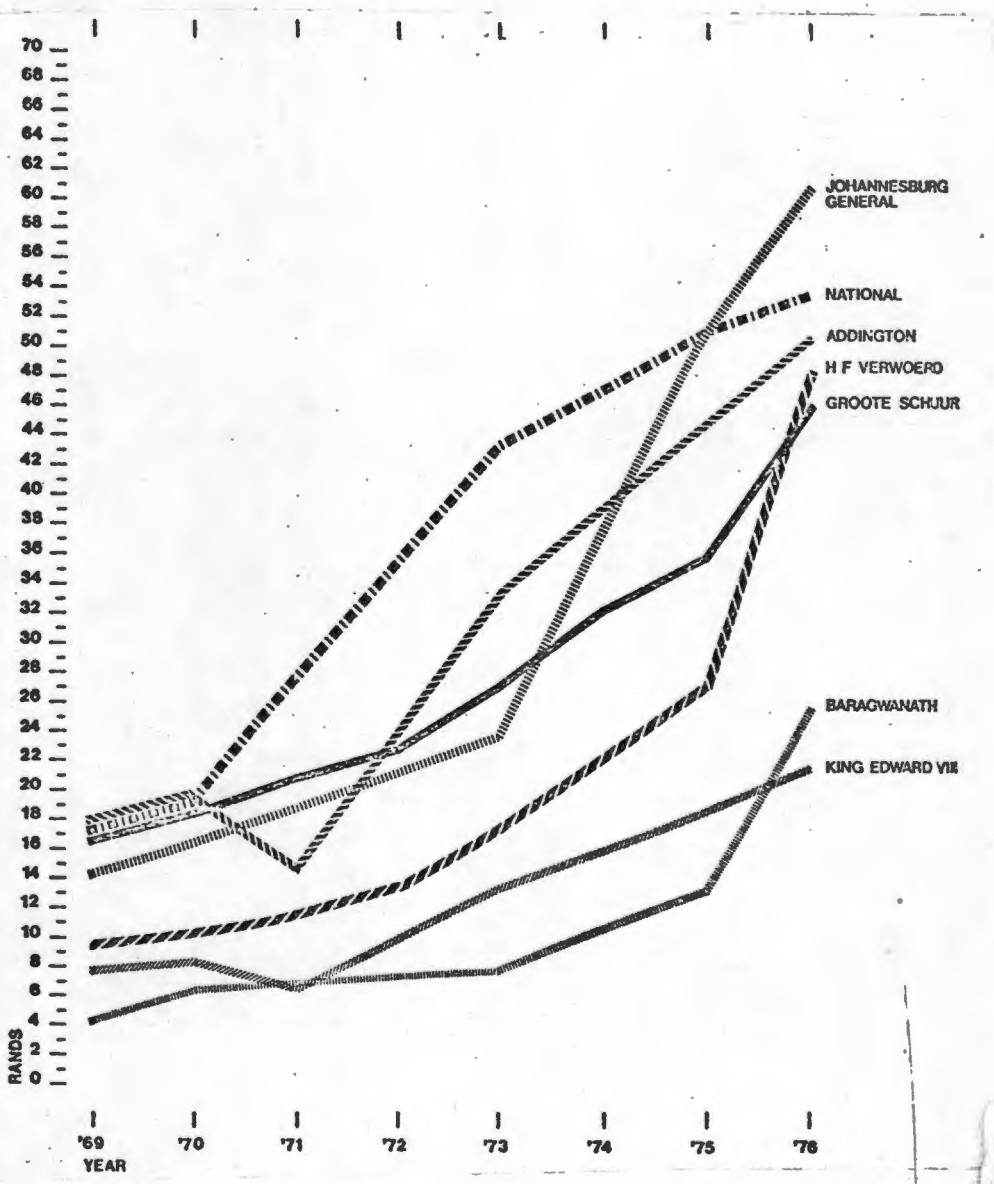

FIGURE 2.2 Comparison of patient day costs for the major academic hospitals in the Republic (1969-1976)

NOTE: Black patients previously treated at H.F. Verwoerd have been transferred to Kalafong Hospital over a period of time.

It is worth noting the difference in the reported volume of activity--based on total daily units for the seven hospitals--for the years 1968 and 1976--see Figure 2.3.[10]

HOSPITAL	TOTAL DAILY UNITS (INCLUDES INPATIENTS/OUTPATIENTS)+ 1968	1976
Johannesburg	649 287	409 887
H.F. Verwoerd	891 146	434 143
Addington	220 095	213 497
National	158 374	180 401
Groote Schuur Group	460 000	880 127*
Baragwanath	1 281 596	829 030
King Edward VIII th	790 985	658 839

FIGURE 2.3 Total Daily Units: South African Academic Hospitals (1968-1976)

NOTE:

+ The accuracy of these figures is questioned. The adjusted daily census (total daily units) for Groote Schuur Hospital Group, calculated from the statistics in the Annual Report for 1968 gives the figure of 683 799. It is possible that those for the other hospitals are also erroneous.

++ The figures for Tygerberg and Karl Bremer Hospitals are not included, as Tygerberg Hospital was being commissioned during this period, while Karl Bremer was being phased out.

* This figure was obtained from the Groote Schuur Hospital Group Annual Report (1976) as the 1976 statistics for Cape Provincial Hospitals are not included in the Hospital Services Year Book (1977).

The total daily units for the Group have increased considerably in the nine year period; those for the National hospital have increased by 30%. Activity at all the other Teaching Hospitals has declined--by as much as 105% at H.F. Verwoerd Hospital and to a lesser extent at the other four institutions. There are undoubtedly many reasons for this decrease, which have not been researched. It is considered, however, that there may well be a correlation between the marked increase in activity at the Groote Schuur Hospital Group and the lesser increase in patient day costs for the Group as compared with the other Teaching Hospitals. The economies of scale may be

the significant factor. It has not proved possible however to draw any valid conclusions from the available data due to the lack of information on the many unknown variables which affect these statistics, and doubt as to the accuracy of the published figures. The need for comparable, accurate, standardised data on the activity of all hospitals is stressed, otherwise essential research into hospital costs and activity cannot be undertaken.

Activity and Cost Indices

The American Hospital Association has attempted to define a Hospital Costs Index (HCI), which measures the cost to hospitals of purchased goods and services. Another Index, the Hospital Intensity Index, was introduced simultaneously, to differentiate between the increases in hospital operating costs and increases in the intensity of services provided (HII).

The HCI and the HII are derived from the measurement of 37 service elements provided in a typical patient day, which include laboratory tests, nursing and medical man hours and housekeeping man hours. The elements are standardised as carefully as possible to ensure comparability and are held constant at the base year (1969) quantities.[11]
The importance of these indices lies in the separation of the price of the commodity (hospital care) from the quantity consumed and in relating costs to improvements in the commodity. At the present time comparable measurements of quality and effectiveness of hospital care are not readily available (see Chapter 7) and assessment of whether the benefits obtained from the service justifies the rapid increase in costs is, therefore, not possible. The HCI and the HII are, however, a first step in the right direction and reflect not only greater quantity of service offered but also increased demand for services--the Say or Roemer effect. This latter concept states that the introduction of new or additional facilities, services and treatment procedures activates the demand for them.[12]

A useful contribution to the investigation of hospital cost inflation by Frank, describes the use of variance analysis based on an eight-component model of hospital costs, which can be used to establish the contribution of each component to cost increases. This method can be applied to groups of hospitals or to individual institutions and could be a valuable tool for research and planning.[13]

This trend of rising costs of hospital services in excess of other costs is also apparent in other countries and is due to many factors--particularly increasing utilisation of hospitals; the effect of health

insurance; higher salaries for hospital personnel; disproportionately high costs of medicines, medical equipment and supplies; expansion of services and expertise; improvements in the quality of care and of the hotel facilities provided; and increasing medical requirements for sophisticated technology.[14] Further research is proposed to enable hospital management to identify and possibly control major causes of hospital cost inflation.

One further point should be made in discussing hospital costs. The available information only reports the visible health care costs. The hidden social costs of ill-health--loss of earnings, loss of productivity, travelling time and expense, the effects on family, community, commerce and industry of sickness and hospitalisation--and welfare costs--are of course not revealed. They cannot, however, be ignored although difficult to quantify, as these factors must be considered in policy making, planning, and decisions on resource allocation.

EXPENDITURE GROOTE SCHUUR HOSPITAL GROUP

The expenditure for the Groote Schuur Hospital Group for the year ended 31 March 1977 amounted to R40 567 648. This money was spent on various items--

Personnel	- salaries, special allowances, subsidies, overtime, bonuses, unemployment insurance contributions, transport levy, etc.
Consumable Supplies	- provisions, cleaning, pharmaceuticals, medical, surgical and radiological sundries.
Non-Consumable Supplies	- major equipment, plant, furniture, linen, cutlery, crockery, tools and hardware, etc.
Operating Expenses	- transport--officials, patients, goods repairs and maintenance--equipment, plant and buildings.
Services	- water, electricity, refuse removal, telephone and postal services, laundry, advertising, machine rental, pauper burials, etc.

The costs for each category are shown in Figure 2.4.

	EXPENDITURE	% OF TOTAL
Personnel	R23 925 663	59,0
Consumable Supplies	R11 997 304	29,5
Non-Consumable Supplies	R 2 601 066	6,4
Operating Expenses	R 2 043 615	5,1
T O T A L	R40 567 648	100%

FIGURE 2.4 Expenditure Categories: Groote Schuur Hospital Group--Financial Year 1976/77

All provincial budgeting is prepared, analysed and controlled under the headings shown in Figure 2.4. Functional budgeting or costing of individual services and departments cannot be effected with existing accounting procedures. The task of the administration as regards allocation and utilisation of resources is impeded by lack of knowledge on precisely how much is spent on any service--and the ability to make rational decisions on resource allocation is therefore severely limited.

THE THEORY OF FINANCIAL MANAGEMENT

A cursory review of some of the newer concepts of financial management in public organisations is necessary, before proposals can be made for improvements and change to the methods used at Groote Schuur Hospital.

Budgeting Procedures

The accepted basis for effective administration of monetary inputs is budgeting. Traditionally the budget is a fiscal machine for raising revenue to meet authorized State expenditure, but in the last 30-40 years it has become increasingly obvious that the budget is not solely a matter of finance in the narrowest sense. Budget policy is now an important part of a government's general economic policy.[15] The budget is a financial plan of the projected expenditure and revenues of the Government, or a unit of government, for the ensuing fiscal period--it is a work programme translated into cash terms.[16]

Preparation of the budget entails collation of expenditure estimates from all the units which are dependent on the State for funds. It also entails calculations of estimated revenue. The budget once approved must then be executed--that is, the spending plan must be implemented and the various agencies must perform the functions to provide the services described or allowed for in the budget, without exceeding the allocation. To ensure that funds are not wasted or misappropriated,there must be accountability and control of expenditure.

1. Pre-audit - Auditing is an essential component of the control process which checks the prospects of compliance and legality of contracts, before the funds are paid out for goods and services bought by public institutions. Control is exercised by rules regarding purchasing; requests for approval prior to placing of orders or calling for tenders; and insistence on use of central contracting facilities and central stores organisations.

2. Post-audit - control involves independent scrutiny of accounts and expenditure--by officials responsible to the Treasury or other controlling agency such as the Provincial Administration. Staff of pay-out sections are held personally accountable for errors and overpayments.[17]

The sums authorised by Parliament are placed at the disposal of the heads of the various departments who are responsible for seeing that expenditure does not exceed the amount authorised. Powers of re-appropriating expenditure for purposes other than that originally intended, may not be deviated from by heads of departments and sub-departments.

In the classical budget, expenditure is classified by specific objects to be acquired, i.e. "line-item budgets". Departmental proposals consist of long lists of categories of items and services to be purchased. This kind of budget is exemplified by Groote Schuur Hospital Group's estimates, which facilitates the accounting aspect of fiscal management and lends itself to central control of decentralised expenditure.

The classical budget is also, typically, incremental--adding this year's changes to last year's budget. 'Incrementalism' is the process whereby previous expenditure plus a percentage for inflation plus a percentage for essential expansion--is submitted as the budget estimate by departmental heads. Existing projects and expenditure are seldom reviewed--only the margin of change--thus ensuring their continued existence.[18]

Such budgets are designed to control spending--not to assist analysis, planning and decision making. Decision makers lack the information necessary for choosing among alternatives; measuring the total immediate cost of activities designed to achieve any single goal; estimating the total, future costs of projects; and evaluating the efficiency and effectiveness of ongoing projects by comparing costs with achievements.[19]

Programme Budgeting emphasises objectives to be achieved rather than objects to be acquired. Work, activities and services are regarded as intermediate steps--not end products. The concept was developed by the American Department of Defence in the 1950s-60s and was initially enthusiastically acclaimed in the United States and other countries.[20]

The Programme Budget attempts -

1. To identify goals, programme objectives--and to identify the resources available to the specific objectives.
2. To analyse the alternatives available and to select the most appropriate or economic option.
3. To take into account planning and probable costs at least five years ahead--

   In a dynamic environment those who do not anticipate and prepare for the future normally discover a crisis when the future becomes the present.[21]
4. To constantly evaluate, control and analyse implementation of programmes as an ongoing process and, if necessary to replan, reprogramme and rebudget--the process of review.[22]

Maximum benefit can be derived from Planning-Programming-Budgeting-Systems (P.P.B.S.) by the concurrent application of techniques such as cost-effectiveness or cost-benefit analysis.

Cost-Effectiveness Analysis

The allocation of resources must be determined by some rational process of decision-making. Cost-effectiveness analysis provides a means of selecting either -

1. The cheapest ways of accomplishing a defined objective - or
2. The maximum value to be obtained from a given expenditure.[23]

This provides an index of effectiveness by ranking but does not provide an absolute measure of the value of a project.

Cost Benefit Analysis

Absolute measures of need and desirability versus costs can be derived from cost-benefit or cost-utility analysis

> a practical way of assessing the desirability of projects where it is important to take the long view (time) and a wide view (side effects) and implies the enumeration of all the relevant costs, not only monetary-and benefits.[24]

Either one of these techniques is integral to P.P.B.S. and effective resource utilisation. The more limited the resources the more necessary such techniques become.[25]

Quantification of social costs and benefits is still an infant science and critics such as Self and Hoos are sceptical about the validity of many of the studies.[26] There is also no certainty that the application of cost-benefit analysis will ensure better decision-making as value judgements and political factors will still predominate. Nonetheless, as stated by Steiner,

> The more hard information is available, the more relevant and effective is the application of judgement to the decision making process.[27]

Despite the potential benefits of P.P.B.S. and cost-effectiveness or cost-benefit analysis, the initial enthusiasm for the concept has not survived the test of practical application and in the United States the Federal Government officially terminated the P.P.B.S. experiment in 1971.[28] Implementation has, however, been successful in some services and there is no doubt that the principles of determining the purposes of expenditure; selection of the most effective purpose; analysis of strategy to achieve that purpose; long term planning and budgeting; and measurement of results achieved by expenditure are essential for efficient management--even if P.P.B.S. and cost-benefit analysis, as originally proposed, prove too cumbersome and costly for practical use.

FINANCIAL MANAGEMENT AT TEACHING HOSPITAL

Neither the Cape Provincial Administration nor Groote Schuur Hospital Group have ventured into the field of contemporary budgeting methods. The procedure currently employed is the traditonal one of line-item budgeting with incremental estimates for expenditure in the next financial year (April 1--March 31) being prepared by all Provincial hospitals during September/October, for submission to the Department of Hospital Services in November.

At Groote Schuur Hospital the process starts with a request to all Departmental Heads in August for their requirements for the following year in various categories--equipment, accommodation and new services. These requirements are not submitted to critical assessment or pruning but are simply collected and collated by the Finance Section of the hospital, costed, summarised and finally presented in detailed break-down in the categories described previously--not in a departmental classification--but as items to be purchased. Estimates for new services are the only section where an approach to programme budgeting is made, where the cost of equipment, staff and maintenance expenses are presented for a functional unit--but only for one year--not long term.

There is no mechanism for costing functions or departmental activities, nor can management responsibility for resource utilisation be delegated to Departmental Heads, as essential data on departmental expenditure is not available.[29] It follows that the administration of the hospital is equally unable to exercise proper control of departments or units, as the information for comparative analysis of expenditure is unobtainable.[30]

It is obvious that until better costing methods are implemented, the possibility of undertaking programme budgeting or cost-effectiveness even in a modified form -- at Groote Schuur Hospital, is a remote one. Further obstacles to such a step are--

1. The absence of standard mechanisms in the South African budgeting system for ensuring the availability of funds for long-term projects.

2. The stop-start financial policy of Central Government which makes long-term financing uncertain and subject to cuts, counteracting the value of planning 5 - 10 years ahead.

3. Programme budgeting and cost-benefit analysis require expertise which is not readily available in the Republic and is expensive in terms of time and money.

There is no justification--despite these problems--for ignoring the potential of new financial management tools. Computerisation of various aspects of hospital activity--including stores and personnel allocation--is under consideration at present, which will simplify costing of consumables and the analysis of staffing costs per unit.[31] Availability of these data will provide the necessary information on functions and programmes for analysis, planning, measurement, control, and decision-making on future resource allocation.

Serious consideration should be given to the institution of 'rolling' budgets whereby provisional estimates of financial requirements can be given for 2-3 year periods as well as firm estimates for the first year.[32] This will allow for the development of programmes on a continuing basis with some certainty that funds will be available when required and for surplus funds to be carried forward into the next fiscal year instead of reverting to the Treasury as at present. 'Rolling programmes' for public expenditure have been used for some years in Britain which indicates the feasibility of this proposal.[33] "A budget rationally designed for management use would open new dimensions of administrative potential."[34]

COST CONTAINMENT

The ultimate aim of administration should be the optimal use of resources in pursuit of stated policy objectives. Optimal implies that not only are resources rationally distributed in accordance with organisational goals but also that resource utilisation is carefully controlled.

The basic processes of auditing have been briefly described. Pre-audit constraints for Groote Schuur Hospital Group are imposed by the official Tender regulations and are strictly adhered to.[35] Post-audit functions are diligently performed by the Provincial auditors and Revenue inspectors.

Control of resource use entails much more than auditing, however, and encompasses the whole field of setting goals; policy-making; allocation of resources; choosing between alternatives; balancing cost and benefit; planning, personnel and materials management; equipment selection and maintenance; building design and maintenance as well as co-ordination, supervision and control and development of effective communication and information systems. Many of these matters are dealt with in subsequent chapters and discussion in this section will be restricted to some general principles of cost containment.

General Principles

Griffiths and his co-authors analysed two medium-sized hospitals over a four year period and concluded that there are four areas in which costs can be most effectively controlled.

1. Planning and control of physical resources--particularly by eliminating duplication of costly facilities and by sharing services.[36] The size of hospitals is another factor of importance which requires investigation as it is generally believed, on the basis of Feldstein's work, that there

are decreasing economies of scale in hospitals which have more than 1 000 beds.[37]

2. Scheduling of Patient attendances and services can reduce costs by increasing occupancy, reducing length of stay and eliminating unnecessary delays and time wasted, in waiting for investigations and procedures.[38]

3. Medical decisions on investigation and treatment account for approximately 75% of total hospital costs.[39] It has been reported that considerable savings can be effected by instituting peer review procedures to control doctors' use of resources.[40] Feldstein claims that increasing the number of doctors employed improves productivity and efficiency--particularly in large hospitals [41]--a finding which requires further investigation.

4. Control of resource utilisation--by measuring performance and comparing it with pre-determined norms. This can result in improved effectiveness and cost containment if practised at departmental head level as well as by the upper echelons of management.[42]

Schulz and Rose believe that controlling costs is in conflict with the other goals of hospital administrators and medical practitioners, who consider high quality care, expansion, acquisition of high technology equipment, research, and increasingly sophisticated facilities and services, as being more desirable institutional goals than cost containment. They suggest that costs can only be controlled if institutional objectives are redefined--initiated by the administrator--to incorporate community needs and by setting priorities such as reducing personnel, limiting high technology expansion and seeking alternatives to hospital in-patient care.[43]

The Groote Schuur Hospital Group is a 1 573 bed academic hospital group with four major functions--patient care, community service, teaching and research. Training of many students in many disciplines, in addition to under- and post graduate medical students, is a major task. Valuable clinical and scientific research is an ongoing process. More than 1 million outpatient attendances and 57 000 admissions are recorded annually in the Group. Groote Schuur Hospital personnel run family planning services, psychiatric and obstetric community services and travel to other centres and rural areas to provide necessary medical care. The average length of stay for the Group is 8,8 days, the average bed occupancy is 103%. The average case-flow rate for inpatients is 38 patients/bed/year compared with Feldstein's average of

23 patients/bed/year in a group of British hospitals.[44] The quality of accommodation offered is certainly not luxurious for patients--and is grossly inadequate in many regards for staff.

In view of these facts it is obvious that cost-savings must be sought in the areas of highest expenditure rather than in attempting to increase utilisation, turnover or to downgrade facilities. Definition of objectives; more efficient design of buildings; more effective organisation, co-ordination and control; more appropriate utilisation of staff; improved scheduling of patient services; reduction in the number of investigations requested; and careful analysis of all services, to ensure that the most cost-effective procedures are used, are avenues which must be explored, some of which are discussed in greater detail in later chapters.

PARTICIPANTS AND INFLUENCE

"He who pays the piper calls the tune."

The old adage is an accurate reflection of the situation in regard to Groote Schuur Hospital Group and its participants. The State, The Cape Provincial Administration and its Department of Hospital Services are undoubtedly the most influential participants in the hospital's environment--but not quite proportionate to their financial input.

The University, whose monetary contribution is negligible, has been given considerable influence in terms of the Joint Agreement. The Divisional heads and other clinical Professorial staff, who have absolute control of the clinical service in the hospital, are appointed by the University who pay 51% of their salaries.[45] The remaining 49% plus a non-pensionable 'overtime' allowance (approximately R5 500/annum in 1977), is paid by the Provincial Administration who effectively, therefore, pay the larger proportion of Professorial salaries but exercise little or no control over the actions of these University employees.

Other clauses in the Joint Agreement confer considerable powers on the University in regard to additions and alterations to hospital buildings; new hospital buildings; control of Joint Staff; advisory responsibility for management and functioning of the group of Teaching Hospitals; and for staff nominations, establishment changes, major equipment, new drugs and other matters.[46]

The Agreement requires that many other matters shall be determined by agreement between the University and the Provincial Administration and also provides a mechanism for consultation "between these two organisations by means of a Joint Standing Advisory Committee" and for settling disputes by arbitration.[47]

The amount of influence exercised by the University over the affairs of Groote Schuur Hospital is clearly unrelated to its financial contribution and derives largely from the historical involvement of the University in the planning, building and development of the hospital and the co-operative relationship between the Cape Hospital Board and the University.

It has not proved possible to quantify in any way the influence of the other participants discussed in Chapter 1. The Teaching Hospital Board, the general public including patients, statutory councils, commerce and industry and many other official, quasi-official and unofficial bodies all affect hospital policy, goals, norms, values and provision of services to a lesser or greater extent as do the personnel employed by the Groote Schuur Hospital Group.

Rhenman attempted to measure the contribution-inducement balance between a hospital and its participants--both external and internal--by assessing the value of the contributions from funding bodies, patients, personnel and other organisations and the rewards received by these participants from their relationship with the hospital.[48] Despite considerable research, analysis and attempts to estimate the power of the participants, he concludes that the result is inconclusive and unsystematic.[49] This is, nonetheless, a very interesting field of study with practical implications for the hospital administrator, who must steer a course between the various spheres of influence and the pressures of conflicting interests without disturbing the delicate balance of power, yet maintaining an effective organisation. Further research would be rewarding.

SUMMARY

The hospital system is dependent upon various inputs in order to achieve its objectives. Financial, human and material resources are the most significant inputs of which money and its management are of prime importance.

The Groote Schuur Hospital Group is wholly subsidised by the Cape Provincial Administration which derives 82% of its funds from the Treasury. In comparison with the income provided by the Provincial Administration, the cash input from the other two contributors, the Teaching Hospital Board and the University, is negligible.

The funds allocated to Groote Schuur Hospital itself are spent on a variety of services to other institutions both in the Group and in other Regions. For clarity and simplicity the whole Group is, therefore, considered as one organisation for analysis of expenditure and costs. Analysis of Group costs and activities for a nine year period indicate that hospital costs have risen disproportionately compared with activity, personnel numbers and the consumer price index. Costs of other Teaching Hospitals in the Republic have risen to an even greater extent which is possibly related to the difference in salaries paid to the various racial groups and the marked increase in activity of the Groote Schuur Hospital Group.

Hospital cost inflation is a cause for serious concern and methods of identifying the causal components should be investigated. Standardisation of hospital statistics and statistical methods is essential before research into these problems can be undertaken.

Newer theories of financial management such as programme budgeting and cost benefit or cost-effectiveness analysis could also assist administrators in achieving more effective and efficient resource utilisation, particularly if accurate costing methods and 'rolling' budgets rather than single year budgeting were implemented. Active cost containment is also essential and various principles can be applied to the process. Those which are applicable to the Groote Schuur Hospital Group will be explored in more detail in the relevant chapters.

The most influential participants in the affairs of the Group are the Provincial Administration and the Department of Hospital Services who provide virtually all the financial input. The University, however, exercises considerable influence over many aspects of hospital activity and personnel, despite its minimal cash contribution. Quantification of the influence of these and other participants has not been possible but further research would be a worthwhile and interesting exercise.

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3. HUMAN RESOURCES

Manpower is the costliest input to the hospital system--functioning in two ways. Firstly, as the raw material (students) which is converted into one of the hospital's products--trained health personnel--and secondly as a major factor in the conversion of other inputs. These aspects of hospital manpower make personnel administration--covering the whole gamut from classification and definition of jobs, through selection, recruitment and allocation to motivation, incentives and rewards--a predominant concern of management. Students of the psycho-social aspects of organisations have also stressed the importance of patterned human behaviour and the roles, values and norms of people working in organisations.[1]

The theory of Personnel Administration in public organisations, including hospitals, is the subject of several excellent texts.[2] This work is not, however, concerned with the principles of personnel management but rather with selected aspects of the human inputs to the hospital system which are relevant to the theme of improving the hospital's product by means of more efficient and more effective use and management of resources.

GENERAL BACKGROUND

Provincial hospitals are governed by the requirements of the Public Service Act and Code[3] which determine the classification of posts including rank and grade; merit systems; salary grading; supplementary benefits; qualifications for appointment and promotion; the application of a closed career system to certain categories of personnel (the Administrative Division); and many other factors affecting hospital employees.

The Staff office, which serves the whole Group, are concerned only with the application of these regulations to hospital employees and deal with the paper work involved in advertising vacancies, making appointments, arranging transfers, promotions, resignations and retirements, payment of salaries, deductions for Pensions, Medical Aid and Income Tax, Housing Subsidy payments, recording leave taken and other administrative functions. Some personnel activities notably recruitment, selection and training are the responsibility of individual departmental heads. The Medical Superintendent and T.H.C.A.C. perform other personnel functions as described in the Joint Agreement.[4] In

addition, the Hospitals Department are responsible for certain activities relating to hospital staff particularly the creation of new posts, determination of some salaries, merit assessment and appointment to promotion posts. There are no professional personnel managers at Teaching Hospital. It is considered that many of the matters which will be discussed in this Chapter, indicate the need for such expertise and for a centralised personnel service to be established.

Classification

The Public Service Staff Code classifies hospital service personnel into five divisions--Administrative, Professional, Technical, Nursing and General (see Figure 3.1). A sixth category contains those staff who are paid at local rates of pay--domestics and labourers of various grades. There are more than 90 categories of personnel in the hospital service divided into several ranks and grades. The organising of all jobs into specific categories based on duties, responsibilities and appropriate qualifications is the cornerstone of a job-orientated career system. This classification is essential for efficient management and motivation of personnel in any enterprise and has particular application in academic hospitals, where diversity of skills and qualifications is possibly greater than in any other organisation. Position-classification, whereby jobs are grouped rationally according to function, responsibility and training--and are given standardised descriptive titles--facilitates selection, promotion placement and training of all categories of staff and also allows for equitable remuneration.[5]

Variable conditions of Employment

Groote Schuur Hospital personnel who work in the Group and/or in Departments at Medical School, are further subdivided by employer and conditions of service (see figure 3.1). These are--

1. Joint Staff, employed by the University on University conditions of service.
2. Joint Staff employed by the Provincial Administration on Provincial conditions of service.[6]
3. Provincial Staff on Provincial conditions of service.

The differing salaries, conditions of service and benefits to which these three groups are entitled counteracts to some extent the advantages of job-classification and leads inevitably to conflict and dissatisfaction.

DIVISION	JOINT STAFF		PROVINCIAL STAFF
	University	Provincial	
Professional	Professors Lecturers - (Pre-clinical)	All non-professorial Medical Staff	Professional Officers (non-medical Scientists)
Technical	Lecturers - (Paramedical) Technicians		All Technical and Paramedical Staff
Nursing	Lecturers - (B.Sc.Nursing)		All nursing personnel (clinical and college)
Administrative			All Administrative Staff
General	Clerical, lab.attendants, cleaners		All other categories

FIGURE 3.1 Classification of Personnel by Division and Employer.

EXPENDITURE ON MANPOWER

In most developed countries payroll expenses absorb 60-75% of total hospital operating budgets.[7] In the United States, the salary component has decreased steadily from approximately 70% in 1956[8] to 59% in 1970 and 52,5% in 1975.[9] The reasons for this are not clear but are possibly indicative of increased expenditure on machinery, equipment, supplies and services--rather than of any reduction in personnel numbers which have in fact risen steadily over the same period. For the Groote Schuur Hospital Group, payroll expenditure as a proportion of total costs, remained more or less constant for the period 1967-1976 at approximately 58%. In the period 1970-1975, actual personnel costs for the Group increased by 128%[10] compared with a rise of 57% for the same period in the United States.[11] These increases have cancelled out the potential benefits of mechanisation and have almost equalled the increased cost of equipment and consumable supplies which rose by 150% at Teaching Hospital between 1970 and 1975.[12]

An analysis of payroll costs for the Group by Divisions is shown in Figure 3.2. It is apparent that the Professional Staff, (89% medical), comprising only 10,6% of the total are paid a disproportionate share of the total payroll (39,5%) and that nursing staff, 40,3% of the total staff establishment constituting the largest group, are comparatively poorly paid (24,8% of total payroll).

Division	Number	% Total Staff	Payroll Costs Rm	% Total Payroll	Value index = % Salary / % Number
Professional	644	10,6	7 529 642	39,5	3,7
Technical	574	9,4	2 499 645	12,9	1,3
Administrative	79	1,3	413 000	2,1	1,6
Nursing	2 450	40,3	4 737 046	24,8	0,6
General	2 341	38,4	3 944 153	20,6	0,5
TOTAL	6 088	100,00	19 423 565	100,00	

FIGURE 3.2 Groote Schuur Hospital Group : Expenditure on Personnel and Value Index (1976)

Value Index

A value index was calculated for the five categories listed in the table, as a ratio of

$$\frac{\text{the amount earned by each group as a percentage of the total payroll cost}}{\text{number of personnel in each group as a percentage of the total establishment}}$$

The value index for professional and technical personnel (3,7) indicates financial rewards which are significantly higher than those received by the other categories, in recognition of high academic qualifications and major responsibility for patient care and teaching. In comparison, the value index for nursing staff (0,6) is considerably lower and is not commensurate with their qualifications or degree of responsibility. A breakdown of nursing personnel into trained and untrained staff, gives a higher value index for trained staff of 1,18 (see Figure 3.3). This is still low, however, compared with the professional, technical and administrative groups and indicates that the nursing profession is undervalued in terms of monetary rewards. This index, applied to more defined categories of staff, may prove to be a useful measure of the value accorded by society to a variety of functions and the

people who perform them. The index could be developed for weighting various categories of jobs in the private as well as the public sector. It might then be useful, in conjunction with job evaluation, for determining appropriate salary scales for key personnel in the hospital service.

	No.	% of total staff	Remuneration	Total	Value Index
Trained nurses (including staff nurses)	908	14,9	2 456 560	12,6%	1,18
Untrained nurses, (including students, pupils, nursing Assts, and orderlies)	1542	25,3	2 280 486	11,7%	0,46
TOTAL	2450	40,3	4 737 046	24,8	0,6

FIGURE 3.3 Value Index for Nursing Staff : Trained and Untrained

The basis of remuneration for the various categories of personnel at Teaching Hospital is determined at present by the Public Service Commission according to the Relative Value of Qualifications (RVQ) as evaluated by the Human Sciences Research Council,[13] and according to experience, length of service, sex, race, age and other factors.

Monetary rewards - Inequities

Salaries in the public sector are generally lower than those paid by commerce and industry, which creates difficulties in recruitment and retention of personnel and contributes significantly to the problems of hospital management. There are, additionally, many factors which mitigate against fair and equitable compensation in the public service, particularly at teaching hospitals.

1. Differential salary scales for black, white and coloured personnel - There is no justification for this practice which is the cause of considerable resentment. It is essential that attempts, which are being made by medical and nursing organisations to achieve equal salaries for all races, should meet with success in the near future.

2. Differential conditions of Employment - As previously mentioned it is considered necessary to eliminate unnecessary friction between Joint Staff and Provincial Staff which arises as a result of higher University salary scales, particularly in the Paramedical disciplines. This could be resolved by amalgamation of teaching and clinical Departments of Speech Therapy, Occupational and Physiotherapy. Slow progress is being made in this regard by the various bodies concerned.[14]

3. Differential RVQ's - The evaluation of qualifications commences at RVQ 8 for a Junior certificate and reaches a top value of RVQ 19 for medical specialists. This grading should go hand-in-hand with Job classification as a basis for equitable remuneration. There are unfortunately anomalies in the grading which negate its intrinsic value--see Figure 3.4.

Qualifications	Place of study	Disciplines	Period of Study	RVQ	Commencing Salary (Annual)
Diploma	In service	Radiography	2 years	12	R3 390
Diploma	In service	Med. Tech.	4 "	12	R3 750
Diploma	College	Nursing	3 "	12	R3 390
B.Sc.	University	Nursing	4 "	13	R3 930
B.Sc.	"	Physio	4 "	13	R3 930
Diploma	College	Social Work	3 "	13	R3 930
B.A.	University	Social Work	3 " *	13	R4 110
B.A.	"	Social Work	4 "	14	R4 470
B.Sc.Hons.	"	Biochemistry	4 "	14	R5 010

FIGURE 3.4 Comparison of RVQ gradings for various qualifications, and salaries of hospital personnel in different disciplines (1978)

Note: * At Universities in the Cape Province the Social Work course is still 3 years. The first 4-year graduates will qualify in 1980.

Newly qualified Radiographers (2 year training--RVQ 12) are paid the same commencing salary as nurses from college (3 year training--also RVQ 12). B.Sc.Hons in Biochemistry RVQ 14 earns R5 010 whereas the 4 year degree in Social Work earns only R4 470. The 4 year degree course for Social Workers merits an RVQ 14 grading whereas the 4 year degree course of Physiotherapy and nursing is only graded RVQ 13. This matter requires investigation and

rectification as the staff affected by these gradings neither understand nor accept the unequal gradings and salary scales, which cause loss of morale, conflict and bitterness.[15]

4. Payment for Overtime - Overtime in hospitals is paid only to personnel working in essential clinical services--excluding nursing staff. It is apparent that clinical staff should not work additional hours if this would affect patients' safety or the quality of care.[16] On the other hand, tired staff are better than no staff and if additional hours are worked on an organised basis to maintain essential services, then personnel should be fairly compensated.

Since 1974 full-time doctors in the Government and Provincial Service have been paid a non-pensionable allowance for additional hours worked. This payment for overtime was finally agreed to in response to considerable pressure from the Medical Association and other full-time medical staff organisations.[17]

There are many disadvantages to this system of additional remuneration which is the antithesis of professionalism. Professor H.W. Snyman President of the S.A. Medical and Dental Council said -

> The standing of doctors falls a little further every time they use methods borrowed from the Shop. Payment by the clock is in itself inappropriate to medicine.[18]

Many doctors--particularly those in teaching hospitals who have teaching and research commitments in addition to their clinical duties, work up to 60-80 hours per week and are therefore still not adequately compensated for their labours.

This system of payment has also caused resentment amongst older clinicians, professors and departmental heads who may earn less than a junior registrar in a learning situation, if they (the seniors) feel unable to work 56 hours/week on a regular basis. In the National Health Service in the United Kingdom a similar situation has arisen and has caused similar angry and adverse reactions.[19]

The present methods of determining an employee's worth to the organisation and to society are patently unsatisfactory, being neither fair nor equitable. Other methods must, therefore, be sought.

Proposed Basis for Equitable Compensation

Before a fair salary scale can be determined for any job, the job must be analysed, described, specified and finally evaluated and then compared with a variety of other occupations.

Job Analysis is the process whereby the important activities pertaining to any job are identified by interview, observation or other means.

> It is the identification of the tasks which comprise the job and the skills, knowledge, abilities and responsibilities that are required of the worker for successful performance and that differentiate the job from all others.[20]

Job Specification is a written statement of the qualities and abilities required from an employee for satisfactory job performance. It sets the standard for the minimum and maximum qualifications needed for the job.

It is essential that the content of jobs and the qualifications needed for the job are accurately defined, if technological and organisational requirements, as well as the social and personal needs of the employee, are to be satisfied. Recruitment, selection, appointment, performance appraisal and promotion criteria are provided automatically--if the study of work is properly done -- and appropriate filling of jobs is greatly simplified. This is the process of job design which should be completed before job evaluation is attempted, particularly in large organisations.[21]

Job Evaluation measures the worth of all the jobs in an organisation in a systematic and logical manner, comparing one job with another in order that the correct rates of pay may be determined.

Basic to the process of job evaluation is the need to identify the characteristics of the job for which the employer is willing to pay. These are called compensable factors and are intrinsic to the job. There are four factors which can be considered as standard--Skill, Effort, Responsibility and Working Conditions which are all discernible to some degree in all jobs.[22]

The compensable factors must be chosen by a group consisting of management and workers to ensure that the selection is accepted and approved by a representative sample of employees from all levels. The same group should also be responsible for determining the weighting which will decide the final value of a factor. This weighting is usually arbitrary and can be based on systems in use elsewhere, but must also relate to the value of that factor for the individual institution.

There are four commonly used methods of evaluation.

Non-Quantitative	1. Ranking
	2. Classification
Quantitative	1. Point Rating
	2. Factor-comparison

For the purpose of this discussion, which is to find a system of evaluation for jobs in hospitals, the non-quantitative methods need not be considered in depth.

1. Ranking, whereby all the jobs to be considered are arbitrarily ranked from top to bottom, is only useful in small organisations. It is a crude system, which can be improved by using a paired-comparison technique but the basic drawbacks of subjectiveness and inconsistency will still prove problematical.[23]

2. Job classification systems assign jobs to classes or grades. Job descriptions are helpful in determining in which class jobs should be placed. The classes, e.g. clerical, nursing, administrative, professional, tend to be very broad and may contain a widespread variety of jobs in one group which are not strictly comparable. The system is however easily understood, inexpensive and simple to apply to large or small undertakings. This is the method used in the Republic for the public service as described by Cloete.[24]

3. The Point Rating method is the most widely used of all job evaluation concepts. It is the simplest of the quantitative methods and has the additional attributes of objectivity, uniformity, consistency and comparability. The whole process of job design must first have been painstakingly completed and the compensable factors defined and weighted. Key jobs must be priced by means of local wage surveys to enable management to fix the rest of the wage structure and a degree scale (geometrically or arithmetically calculated) must be constructed.[25] If the points are extended along a continuum for each degree, considerable flexibility can be attained which is invaluable in an organisation such as Groote Schuur Hospital where the range of skills, education and responsibility is so great.

A useful point-rating scheme devised by Peromnes is appended as Appendix A at the end of this chapter.[26] Eight factors are described and graded--problem-solving, consequences of errors of judgement, pressure of work, knowledge, comprehension, equivalent educational qualifications and training

experience. The maximum number of points awarded for each factor is 170 which increases exponentially from the lowest to the highest grade.

Factor comparison ensures comparability of various jobs--all jobs are compared automatically with key jobs and those previously evaluated, factor by factor. Secondly, evaluation can be carried out directly in terms of money although in practice most users convert cash values to points to avoid constant adjustments to match changing wage levels.[27]

Factor comparison is complex. It is difficult to establish and explain and time-consuming to administer, and if the key jobs are not accurately evaluated the entire structure will be skewed for value and wage level. There is no degree-value scale incorporated in factor comparison evaluation which makes this method somewhat arbitrary and rigid.

Large enterprises such as Groote Schuur Hospital would derive considerable benefit from the use of either of the two quantitative methods of job evaluation. Point-rating systems have several advantages--as described--and it is considered that a system like the Perommes job-rating scale could be developed very satisfactorily for use in hospitals--with some adjustment and changes to select the most suitable factors. Groote Schuur Hospital is not, however, an isolated entity but is part of the Public Service and must be considered in that context. Job evaluation for Provincial hospitals might well involve evaluation of all jobs in the Public Service and consequent restructuring of the classification. This would be an interesting and worth-while undertaking and it is considered that research in this field should be pursued.

Monetary rewards are not the only inducements which can be offered to personnel to increase productivity, efficiency and job satisfaction as the work of many sociologists, psychologists and others has indicated.[28] The need for self-actualisation; good work relationships; effective communication; goal congruence; a pleasant physical environment; facilities and time for research; availability of equipment and personnel; subsidised visits to overseas institutions and conferences; managerial concern for the welfare of employees; provision of standard benefits--and many other factors, must be taken into account if the human resources of organisations are to be effectively managed. Equitable remuneration is nonetheless of considerable importance for 'economic man' and the development of a fairer basis of remuneration should be given high priority by the relevant authorities.

STAFFING RATIOS

In view of the large amount of money spent annually on personnel, hospital management must concern itself most particularly with determining--

1. The correct number of employees required to perform essential functions.
2. The most effective and economical allocation of all categories and grades of staff.
3. The effect of personnel numbers on quality and outcome of hospital care.

Staffing ratios are useful measures for detecting areas of inappropriate staffing levels and serve as a basis for intra- and interhospital comparisons and for forward planning of personnel needs. Johnsson and Neuhauser, in analysing the difference in Swedish and American hospital staffing ratios, conclude that the reasons are multifactorial and complex. Their study is of value in pinpointing the causes for high staffing ratios in American hospitals and reveals that the South African situation lies somewhere between the two countries studied, in terms of social practices, philosophy of medical care, national economy, availability of labour and so on.[29] Comparison between staffing ratios at Groote Schuur Hospital and other hospitals, both local and overseas, proved to be a frustrating exercise due to the lack of definition of published statistics and of the methods of collection and calculation. The most clearly defined information is the statistics published by the American Hospital Association, for a large universe of community general hospitals in the United States and these are, therefore the only figures used for comparison.

Relevant Definitions

1. A patient day is the unit of measure denoting lodging facilities provided and services rendered to one inpatient between the census-taking hour on two successive days.[30]

2. Adjusted patient days

   The equivalent admission rate includes outpatient visits converted to equivalent inpatient days on the basis of 5.74 outpatient visits = one inpatient day. This equivalence is derived from the ratio of hospital revenues from outpatient visits to revenues from inpatient days of care, the conversion developed and used by the American Hospital Association..... This conversion ratio varies annually.[31]

3. Adjusted census is derived by dividing the number of adjusted patient days by the number of days in the year. Adjusted patient days account for both inpatient and outpatient services.[32]

4. Full-time equivalent (FTE) personnel (is) calculated by adding half the number of part-time personnel to the total number of full-time employees.[33]

Calculations

The figure of 5,74 was the ratio calculated for American hospitals in 1970. Calculations based on the data published in 1976 indicate that the ratio is fairly constant[34] and this figure will, therefore, be used in calculating comparative staffing ratios for the Groote Schuur Hospital Group.

The relevant statistics for 1976 are[35]

Inpatient days 479 079

Outpatient attendances 1 203 145

∴ Inpatient equivalent $\frac{1\,203\,145}{5.74} = 209\,607$

Adjusted patient days 209 607 + 479 079 = 688 686

Adjusted daily census (1976 was a leap year) $\frac{688\,686}{366} = 1\,882$

Full-time personnel 5 500

Part-time personnel 588

∴ FTE = 5 794 (5 500 + (1/2 x 588))

Ratio FTE : adjusted daily census = $\frac{5794}{1882} = 3.08$

The rate = 308 FTE for 100 adjusted daily census.

Cape Peninsula Hospitals use an arbitrary 3:1 ratio for equating outpatient attendance with inpatient days. If the previous calculations are repeated using the 3:1 ratio rather than 5,74:1 to derive inpatient equivalents, the rate = 241 FTE for 100 adjusted daily census (total daily units). Whichever ratio is used for calculating inpatient equivalents, the 1976 rate for the Group is lower than the 1976 average of 350 FTE for 100 adjusted daily census for community general hospitals in the U.S.A.--which has risen steadily from 268 in 1970.[36]

The total number of people employed in the Groote Schuur Hospital Group (6088 in 1976) seems high. It would appear, however, that compared with the average American hospital the Group may well be understaffed. As an academic hospital group with teaching and research commitments it is a major referral centre, treating intensively a complex case-mix of patients suffering from severe and complicated illnesses. To perform these functions effectively it is suggested that the staffing rate should be higher not lower than the average

community general hospital in the U.S.A. where, in addition, mechanisation is more advanced and labour more expensive.

General hospital staffing rates serve several purposes.

1. It has been reported that they are valuable indicators of the quality and effectiveness of patient care and as a function of task complexity and technological sophistication.[37]

2. They provide an indicator for determining reasonable staffing requirements, which will assist administrators in making rational decisions on justified need for additional personnel rather than unquantified demand.

The present state of the art in obtaining data for comparative and evaluative purposes is unsatisfactory and there is a pressing need for uniformity and standardisation of methods of measurement, collection and calculation of hospital statistics in the Republic. Information on the appropriate number of personnel required to provide various levels of service would be of great value for planners of hospital services and research into this subject should be given high priority by state and Provincial health service administrators.

Having considered overall staffing ratios, attention should next be directed towards individual categories of hospital staff. A great deal of research into nurse staffing has been reported in the literature and the methodology for this discipline is fairly advanced. Discussion of staffing ratios for specific categories, will, therefore, be restricted to nursing personnel, anticipating that other groups can be investigated at a later stage using similar methods.

ALLOCATION OF NURSING STAFF

One of the earliest American nurse staffing recommendations was published by the National League of Nursing Education in 1937.[38] That committee proposed that 3,5 nursing hours per patient day be used as a guideline. The first attempt at scientific analysis of nurse staffing needs in England was published by the Manchester Regional Hospital Board in 1957.[39] This method assessed workloads in each type of nursing unit and determined a ratio of beds to full-time nurses. This was followed in 1965 by the Report of the Working Party on the Revenue Consequences of Capital Schemes.[40] This working party produced a strategy for nurse manpower planning which became known as the R.C.C.S. formula and which has been extensively used. Nursing allocations at Groote Schuur Hospital, which resulted from a survey conducted in the Republic

several years ago, are generally similar to this formula.[41]

These earlier methods recommended very clearly-defined ratios for various wards and patient types, with allowances for particular departments e.g. emergency and outpatients; for the size of the ward; for pupil and student nurse study time; for the proportion of trained, untrained, and learners and many other variables. All these formulae were based on the ratio of nursing staff to beds or to census. The mix of staff i.e. the ratio of trained and untrained staff and the proportion of student nurses was also defined, but unanimity has not yet been reached in this regard. It was soon generally realised, however, that such an approach was unsatisfactory, because nursing needs do not correlate well with either beds or census but are dependent, primarily, on the amount of care required by individual patients (which changes constantly) and the standard of nursing to be attained or the quality of care desired. Needs are also dependent on effective utilisation and adequate motivation of nursing staff.

Patient classification and staffing

During the 60s several researchers published patient classifications which aimed at determining categories which would reflect the level of need for nursing services.[42] The basic classification was into three levels of dependency and the associated care required.

1. Independent - Self care
2. Partially dependent - Partial care
3. Totally dependent - Complete care

This classification and its application have been intensively investigated, expanded, modified, included in the basic planning for Progressive Care Nursing and for hospital design--but have failed to achieve universal acceptance or usage. Several problems have not been satisfactorily resolved--particularly those associated with weighting for each category. Variability of Hospital design; ward layout; admission and discharge procedures; standards of practice; sophistication of equipment; and availability of ancillary personnel and services are unquantifiable and make standardisation difficult if not impossible. It has, therefore, been necessary for each hospital to carry out its own time-consuming and costly work-study investigations to determine individual weightings and the patient classification concept has only achieved limited recognition as a result.

Relationship between staffing and Quality of Care

At the same time many workers and organisations started to investigate the relationship between nurse staffing and quality of care and methods of quantifying quality. These studies indicated a very wide range of staffing ratios in apparently similar hospitals, which could not be accounted for even after standardisation of variable factors. It was generally accepted that staffing patterns and ratios affect the quality of care and the Ministry of Health in conjunction with the Royal College of Nursing set up a Project Team to investigate and establish, if possible, criteria for measuring the quality of care.[43] If the quality desired can be defined, it should then be possible to assess the number of nurses needed to achieve that quality, bearing in mind that quantity alone does not ensure high quality.[44]

Some methods for measuring quality of care will be discussed briefly in Chapter 7, but no satisfactory method of relating quality of care to quantity of personnel has yet been devised according to Rule.

> There is so far no measurement which can satisfactorily be applied to the establishment of nurses required to carry out patient care at an optimum level.[45]

Methodologies

Although a universally acceptable methodology for assessing staffing needs does not yet exist, some very interesting techniques are being applied to the problem and new concepts, which are attracting considerable support have been propounded.[46]

1. Simple description--The simple descriptive process is the simplest and most widely used method of assessing nursing staff requirements. Information about a variety of factors from different sources is used, relying upon previous experience, norms set by standard reported ratios, and standards set by professional organisations. Census data and procedures regarding admissions, discharges and availability of personnel are also taken into account. Decisions re staffing are intuitive, based on anecdotal knowledge and 'rule of thumb' calculations.

This method is the basis for assessing nursing requirements at Groote Schuur Hospital which are calculated from a set of rules, similar to the R.C.C.S. formula. This allows for variations in degree of illness, medical specialties, outpatient departments, theatres and so on and makes the necessary provision for sick and vacation leave, student nurse study periods, off duties, etc.

The staffing of Intensive Care (IC) units at Groote Schuur Hospital provides an example. The allocation is based on a requirement of -

1 IC trained sister for every 4 patients.

1 assistant nurse for every 4 patients.

It has been found from experience that 5 nurses are needed to ensure that ONE is always on duty in the IC unit for 168 hours per week (i.e. 24 hours X 7 days), 12 months in the year.
It is therefore necessary to have 10 nurses (5 trained and 5 assistants) for a 4 bed unit or 20 nurses for an 8 bed unit.

In comparison Tinker states -

> The staffing in an intensive therapy unit has to be based on a ratio of one nurse per patient for each 24 hours. Including the necessary allowances for holidays and occasional absences, this means a complement of 4,25 nurses per bed and a total of 34 for an eight bed I.T.U. (emphasis mine)[47]

Boam gives the figure of 4.2 staff required to provide continuous cover by one nurse for 168 hours per week.[48] It is obvious that Boam's and Tinker's figures are similarly derived and both recommend a higher staffing ratio than is the norm at Teaching Hospital.

The practicality of the empirical approach is further evidenced by the remarkable similarity of the figures given for nursing hours per patient in -

1937 - by the National League of Nursing Education - 3,5 nursing hours per patient.

1966 - by Paetznick for the W.H.O. - 3,27 nursing hours per patient.

Paetznick's guide for staffing, based on information and opinion collected from 112 nurses, doctors and hospital administrators from various countries and visits to hospitals and health units, is an admirable example of the descriptive method.[49] These methods have much to recommend them--notably simplicity, practicality and cheapness.

2. Industrial Engineering - This more sophisticated approach to nurse staffing studies specific activities, work flow, reorganisation and assignment and simplification of tasks. The major value of industrial engineering is in the analysis of repetitive tasks and for programming the labour force in appropriate situations. Work Study investigation of the work actually done by the nursing staff is of value in revealing the amount of non-nursing work done--particularly by head nurses.

In a recent study the Work Study Branch of the Cape Provincial Administration used random-sampling techniques to study the work of the trained nursing staff in Gynaecology and Obstetrics Wards and Neonatal units.[50] This study resulted from a recommendation by Sanders to the Director of Hospital Services in 1973 that trained nurses should receive work study training and be utilised to investigate staffing needs in Cape Provincial Hospitals.[51] The study is still incomplete but it is hoped that future investigations will include all nursing grades and that factors such as ward design and bed occupancy will be taken into account. Durbin and Springall describe a very detailed investigation undertaken at Case Hospital which has provided that institution with valuable guidelines for nursing staff allocations.[52]

Work Study is a technique which must be used with care. It is not generally appreciated that work study is a potent agent for perpetuating and formalising what already exists and that work study analyses per se can entrench incorrect work habits and patterns. Furthermore, as indicated by the Hawthorne experiments, measured productivity in manual work increases with the interest workers feel is being taken in them[53] and inevitably, people work harder if they are being watched--particularly if the watcher has a stop-watch in his hand. The reports of work study measurements, must, therefore, be examined critically, acknowledging that the report is not necessarily an accurate reflection of normal daily activity and may present a picture distorted by the circumstances of the recording.

Nursing staff tend in any event to concentrate on task-oriented activities, assigning these higher priority than psycho-social activities such as patient education, comfort, support and family counselling. This tendency is emphasised by work sampling analysis and techniques on which nursing allocations may be based.[54]

Work Study is no more than a useful tool. It is inherently too rigid and bureaucratic in its approach to be permitted to dictate final policy and should be only one component of the process of assessing nursing staff requirements--and not the entire process.

3. Operations Research--There are few reports in the literature on the application of operations research to nurse staffing. Griffiths describes several mathematical programming models but states (work published in 1972) that few of these had reached the stage of practical application.[55]

Wolfe's Nurse Staffing Model relates the optimal mix of nursing staff on a patient unit to cost. Using a panel of nurses, Wolfe divided nursing care into nine task categories and subdivided these again into severity of illness.[56] This method apparently required considerable manipulation to allow for a variety of unquantifiable factors and needed refinement before it could be utilised. Griffiths also refers to work by Warner and the General Electric Company "Medinet" service[57] where mathematical programming and computers have been successfully used to determine weighting for skill levels, care required, maxima and minima of staffing levels and the allocation of 'pool nurses'.

3.1 The Nursing Pool - A significant improvement in nursing staff allocations has been effected by the increasing utilisation of a 'float' or 'pool' of nurses. In most hospitals, units are staffed as near maximum as the staffing position allows, at all times, in order to guarantee adequate coverage at peak periods. This system is obviously wasteful and the rationale for utilising a float of staff has long been accepted. Large hospital wide floats are impractical, however, and demand too wide a range of capability and experience from the nurses in the pool.

Bahr and associates have proposed a limited pool system, which, in their hospital, operates in the surgical wards only.[58] The concept can obviously be extended, so that hospitals would maintain several pools, each serving related specialties and generalised overstaffing could be minimised. Bahr's system has been computerised and they report that approximately 85% of the original work force are still employed in the surgical units as before; ± 8% form the pool and the services of the other 7% are no longer required--the equivalent of eleven full-time professional nurses. Several other interesting reports describe the use of part-timers in the pool and incorporate evaluative reporting and budgeting components.[59]

3.2 Queueing Theory can be utilised to determine the number of pool staff likely to be required for different shifts in various departments, allowing for changing priorities, although the technique has limitations if there is a wide range of options.[60]

3.3 Monte Carlo Simulation can also be used if computer facilities are available to test the alternatives and to present to nursing administrators the possible effects of, for example, an unexpected increase in the number of patients. The number of additional nurses required for additional patients,

would be precisely determined and possible deterioration in service if the need is not met, could be defined. The administrator is thus enabled to take appropriate action timeously if a staff short-fall occurs and the standard of care in a unit is at risk.[61]

Operations Research is developing fast in this field but it is expensive and requires strong technical skills and computer availability. It would seem that these methods are unlikely to find a practical application for some years yet in the Republic but certainly look promising for solving problems in the future.

4. Management Engineering--This methodology utilises the tools of both industrial engineering and operations research in determining nurse staffing requirements. It also employs the techniques described under the simple descriptive method and draws upon systems theory, as well as setting objectives, evaluating performance and imposing quality control. As with all ideal concepts the practice falls far behind the formulation and considerable effort is still required before the methods achieve general acceptance and applicability. There are several outstanding contributions in this field, notably the Community Systems Foundation manuals, the Commission on Administrative Services in Hospitals (CASH) programme in California, and the Aberdeen formula applied in the United Kingdom.[62]

These methods take into account Patient Classification and Progressive Patient Care requirements, ward layout, specialities, bed occupancy, availability of ancillary personnel and special services such as central sterile supply and central linen supply. The Aberdeen Group found quality of care impossible to define but did define standards of care and allocated appropriate duties to different grades of nursing staff. The formula now in use derived from a detailed survey of many factors and has been found to be applicable to most non-mental hospitals in Scotland and to several hospitals in England. Before these methods can be implemented, however, extensive recording of patient dependency, desirable standards of care, nursing workload and the other variables on which the formulae are based, must be completed.

Staffing and Costs

In a review of the literature for 1976 Christman criticises most of the nurse staffing methodologies for failing to examine the cost implications

of nursing care.[63] It is apparent that ever-increasing pressure for reduction in hospital expenditure is forcing researchers to give more thought to this important aspect of staffing needs. Man hours per unit related to output (nursing and other staff) is an effective measurement of cost which requires investigation for possible use at Groote Schuur Hospital.

Application of Methods

There are as yet no final answers to the problems of determining present nursing staff needs or of forecasting future requirements. Many of the sophisticated techniques described are not available to hospital management in this country. It is possible, however, to select an assortment of the more appropriate or applicable methods and to start rationalising staffing of various units at Groote Schuur Hospital, anticipating that operations research and computer technology will be available within a few years if required.

1. Work Study--An admirable start has been made with the work study now underway on the time spent on various activities during the sister's working day. This must be extended to all grades of nursing staff including students. The study should also assess the various tasks which can be assigned to each grade for comparison with the Aberdeen formula.[64] The optimal mix of nursing grades and the tasks allocated to each shift must be determined.

2. Patient Classification--Each nursing unit should keep careful records to determine the average degree of patient dependency in that unit. Many of the methodologies make specific recommendations for recording dependency of individual patients.[65]

3. Variables--Using the available formulae, allowance must be made for all the additional factors--ward layout, availability of other personnel, special services, hours of duty, discharge and admission procedures, special care and emergency units, theatres, outpatient departments, student teaching, vacation and sick leave. Allowance must also be made in calculating staffing needs, for elderly staff members and those nurses who are relatively unproductive or inefficient due to physical or mental infirmity. Every hospital has and will always have, a proportion of nurses (as well as other staff) in this category.

4. Scheduling--Using a formula and weightings, which after investigation and careful consideration are selected as the most suitable for local use, short-term and long-term staffing schedules should be calculable with comparative

ease. The availability of computing power will obviously facilitate scheduling and attention should be paid to this in planning computer developments.

5. Pool/Part timers--The provision of a floating reserve of qualified nurses (full and part-time) is essential, to ensure economic utilisation of nursing personnel, and should be implemented without delay for specific services. Special incentives should be offered pool nurses to compensate for the disadvantages and additional stresses incurred in being a 'floating' nurse.

In order to investigate nursing staff allocations as outlined above, it will be necessary to set up a work team to select the most appropriate system and to follow through with implementation and training. Such a procedure will be time-consuming and expensive. It is considered, however, that both time and money would be well spent if the endeavour resulted in more effective use of available nursing manpower and better service to the patient. It is anticipated that the methods developed will be applicable to other categories of hospital personnel in broad principle, but the shortage of trained nursing staff and their importance in the patient care and administrative processes of the hospital, make more rational allocations and utilisation of this scarce resource a managerial priority.

SUMMARY

Manpower must be considered both as a resource and as the means for processing other resources. The hospital organisation is totally dependent on its human resources for achievement of organisational goals and proficient personnel management is, therefore, essential. At present there is no professional personnel management at Groote Schuur Hospital and it is considered that urgent attention should be given to instituting effective personnel policies with qualified managers.

Provincial hospitals are governed by the Public Service Act, Code and Classification which is administered by the Hospital Staff Office. Teaching Hospitals are also affected by University employment practices. In the absence of a personnel department, several aspects of the personnel functions are performed at various levels by many people, including Departmental Heads, Medical Superintendents, THCAC and the Department of Hospital Services

Expenditure on manpower is the major component of hospital costs. Comparing payroll costs with personnel numbers in various divisions it is possible to calculate a Value Index for the five divisions which provides a

basis for assessing the 'value' of various categories of staff. The Value Index for both trained and untrained nursing personnel is lower than for comparable disciplines and emphasises the need to reassess the system of compensation.

The basis for remuneration in the Hospital Service is considered to be inequitable for several reasons. Job design and evaluation--possibly in conjunction with the Value Index would provide a fairer basis for remuneration, remembering that rewards, benefits and other motivators also play a significant role.

Manpower is so important and so costly a resource that it must be utilised efficiently and effectively. Overall staffing ratios are considered to be indicators of quality and effectiveness and provide useful guidelines for assessing staffing requirements and for planning. Rational and economical allocation of staff is essential to ensure that maximum benefit is gained from the human resource input.

Many methods for allocating nursing personnel are in use, several of which would be suitable for use at Groote Schuur. Sophisticated operations research and computer techniques may become applicable in the future but are both costly and generally unavailable at present. A 'pool' of nurses offers immediate relief to nurse staffing shortages and should be investigated, with other methods, to achieve more rational, economical and effective staff utilisation. Once suitable methods have been developed, it should be possible to adapt them for determining staffing allocations of all categories of personnel.

PEROMNES SALARY SURVEYS (PTY) LIMITED

JOB RATING SCALE

GENERAL INSTRUCTIONS

1. The scale should be used to evaluate jobs and never the incumbent in the job *(See Note 5 on "cut-off points).*

2. Each factor is divided into nine progressive definitions.

3. At any level of the scale all lower definitions are understood to apply.

4. To evaluate a job start reading at definition Ø or 1. *N.B.* The lowest definitions are also applicable in part to the highest jobs: even a managing director responds to "single concrete clues" as a part of his job.

5. Continue to read progressively and accumulatively until you reach the *first definition* which is just *too high* for the job you are evaluating, then return to the previous apt definition. Printed below this will be numbers, one of which must be entered on the score sheet. Should part of this definition be apt, but not all, an intermediate score will apply. All numbers from Ø to 170 are available, not only those printed. Critical judgement of the evidence will help you to quantify your score in each factor.

6. When a definition is just too high – *nothing* can be considered at or beyond that point on the scale for the job being evaluated. Remember not to score the point which is "just too high!" Back track and quantify the last apt definition.

7. All scores should be based on critical incidents and factual situations for which evidence is clear, definable and verifiable. Ask when does it happen? How often? With what results?

8. It is pointed out that the definitions 1 to 9 in the factors increase exponentially, not linearly. The step from definition 1 to definition 2 is small compared with the step from definition 7 to 8.

9. Some of the terms are defined on the back page of this scale. The explanations are those used universally by participants and assist in setting a norm throughout the Republic.

JANUARY 1977

FACTOR 1 : PROBLEM SOLVING (DECISIONS)

A decision can be interpreted as the solving of a problem where alternative actions are possible. The incumbent must identify the alternatives and decide which is best. The process varies from simple decisions with only a few easily identifiable alternatives within the framework of specified work procedures, to decisions which become more difficult where clues are unlimited. At the higher levels the incumbent must initiate alternatives, the effectiveness of which may be in doubt.

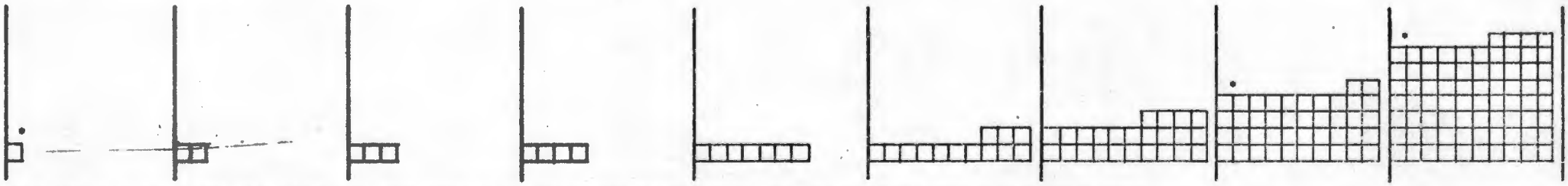
Clues: Information used to arrive at a decision. *Alternatives:* Different solutions which can be applied to a problem.

1	2	3	4	5	6	7	8	9
Responds to single concrete clues, which are immediately (directly) perceptible. Alternatives practically do not exist.	Responds to a limited number of concrete, immediately perceptible clues which appear in a routine. Alternatives are limited and prescribed or obvious.	Clues consist of isolated but obvious deviations from normal routine. **Additional clues are freely available.** Alternatives are still limited but demand a degree of **reasoning** to be able to make a choice. A minimal degree of freedom from strict routine is allowed.	Clues are less obvious but not contradictory and can be interpreted by **direct reasoning.** More possible alternatives which require **interpretation and independent reasoning** in the light of circumstances are encountered. Incumbent allowed to make non-routine decisions without constant reference to a superior.	Clues are readily available but indirect and form a wider variety which must be applied selectively to identify the problem precisely, **especially with regard to new problems** which may appear on occasions. Alternatives are **not self evident** and must be considered closely in the light of possible implications.	Clues are **vague** and require that the incumbent not only **acts selectively** but also investigates particular clues more closely. **Alternatives are developed through active investigation** and the **testing** of possible conclusions.	Clues are manifold, **abstract** and of divergent meaning. Implications of clues are determined by searching personal investigation as well as by available specialised advice. **Alternatives** are interpreted and **created** by **original** deductions which are made in continually changing circumstances.	Clues are abstract, incomplete and doubtful and must be formulated by **new methods of investigation, own deduction and abstraction.** Alternatives are indefinite and must be formulated by the incumbent taking into consideration the **possible but unknown influence of manifold dynamic factors** within, as well as outside, the company.	Clues are extremely abstract, **subtle and undefined. Problems** must be **formulated** by own conceptualism and creative thinking. **Consultation not available** and the reference framework must be built up for **each individual case.** Radical conclusions are the result of a **long process of abstraction and generalisation.**

0 0,5 1 2 3 4 5 6 7 8 9 10 13 14 17 22 23 30 42 54 75 96 133 170

Ø Reacts only to direct instructions: does not make independent decisions.

(All numbers are available, not only those printed)



*THE ABOVE BLOCKS ARE NOT ABSOLUTE, BUT ONLY ILLUSTRATE THE EXPONENTIAL FUNCTION OF THE SCALE IN EACH FACTOR.

FACTOR 2 : CONSEQUENCE OF ERRORS OF JUDGEMENT

This factor measures the consequences of wrong decisions as reflected in losses and their extent e.g. financial losses related to material or manpower, or loss of prestige, internal and external.

1	2	3	4	5	6	7	8	9
Errors have very limited (negligible) impact and can be rectified by repeating the job. The cost is usually wasted time and labour.	Errors have little impact on a production or office system – usually remedied by supervision.	Errors have definite but limited impact – may upset a significant day's programme and probably involving management.	Errors have a definite perceptible impact, limited to a specific sector (internally) e.g. accounts, personnel department, buying, etc.	Errors, e.g. poor supervision, ineffective administration procedures, have a cumulative effect internally. Errors involve different sections.	Errors have implications which can affect the whole organisation with the possibility of significant repercussions outside the company, e.g. prestige.	Errors may have consequences on prestige and will result in substantial reduction in profit expectations. May have limited influence on a specific environment.	Errors seriously affect the organisation in terms of money, material, manpower and prestige, e.g. on its survival.	Errors have major effect on the survival of the organisation and on the environment, e.g. may affect the national economy.

0 0,5 1 2 3 4 5 6 7 8 9 10 13 14 17 22 23 30 42 54 75 96 133 170

⓪ Hardly perceptible to production.

FACTOR 3 : PRESSURE OF WORK

This factor measures the amount of stress inherent in the job, as reflected in the volume and type of work as well as available time.

1	2	3	4	5	6	7	8	9
Regular, steady flow of work. No pressing dead lines.	Regular flow of work subjected to expected seasonal fluctuations. (Seasonal implies that fluctuations of pressure are foreseen and can be planned for.)	Flow of work subjected to a few unforseen peak periods. (Unforeseen implies that plans cannot be made for pressure fluctuations.)	Attention divided between parallel or similar tasks. Sometimes necessary to take immediate decisions. More dead lines than a few unforseen peaks.	Attention divided because of considerable interruptions, simultaneous handling of a variety of tasks, discussions, etc., usually within one discipline. Frequent peak periods during which immediate decision must be made.	Varied and divided attention throughout the day because of the simultaneous handling of a wide variety of tasks and frequent interruptions, some of which are outside a single discipline. Prolonged periods of stress are usual.	Work is normally subjected to prolonged peak periods and consists of a wide variety of different interdisciplinary tasks. Decisions are made under definite time stress and pressure normally continues beyond office hours because of the volume of work and time limits imposed by the job.	Decisions are made in an ever changing environment. Consequently there is nearly always an element of risk, uncertainty and mental stress involved. *Examples:* Government policies, stock market, the economy, resources, labour, etc. are constantly changing	Continued and considerable risk as well as time stress. Dependent on others e.g. advisors, for correct information and conclusions. (The "final buck" stops here).

0 0,5 1 2 3 4 5 6 7 8 9 10 13 14 17 22 23 30 42 54 75 96 133 170

⓪ Only works on direct instructions: no mental stress involved.

FACTOR 4 : KNOWLEDGE

This factor measures the level of knowledge which is necessary in order to fill the position competently. *N.B.* The term scientific does not refer to natural sciences only, e.g. marketing.

1	2	3	4	5	6	7	8	9
Knowledge of basic requirements needed to perform simple tasks.	Knowledge of **standardized routines** and procedures embodied in a number of tasks.	Knowledge of instructions and regulations that are applicable to a **variety of procedures** within a specific system.	Knowledge of the composition, functioning and **changing of a system that affects different sections.**	Extensive knowledge of a technical field *or* of the co-ordination of numerous systems *or* **semi-professional knowledge.**	**Professional knowledge.** Broad insight and skill in **scientific theory** and **principles.**	**Master** of theory, practice and techniques of a scientific field gained by **specialised training** and many years of experience.	**Profound** knowledge and mastery of a scientific field. Recognised as **an authority** within own country.	**Unique** authority on principles, theories and practice of a scientific field. **Internationally** recognised as an authority in that field.

0 0,5 1 2 3 4 5 6 7 8 9 10 13 14 17 22 23 30 42 54 75 96 133 170

Ø Reacts only to direct instructions: needs no basic knowledge.

FACTOR 5 : JOB IMPACT

This factor measures the scope or area in which the activities in a job have an influence. In definitions 1 to 6 a score above the line can be found; then one below the line, not necessarily within the same block. These two scores are added together and divided by two, e.g. 22 above the line and 8 below = 30 divided by 2 = 15.

1	2	3	4	5	6	7	8	9
Activities limited to own specific post. ——— No direct working contacts of any significance, externally.	Impact limited to **a section** in own organisation. Activities essentially alike *viz.* limited number of processes. In case of diversions from routine, supervisors are influenced by incumbent's reports when making a decision. ——— Very infrequent external contacts of little consequence.	Impact limited to **a section** in own organisation. Activities include that incumbent, because of **superior knowledge,** influences others in their performance on the job; enables colleagues and superiors to make decisions by presenting data. ——— Contact with public limited to transfer of information.	Impact (internal) affects **various sections** in own organisation. Takes part in discussions with superiors and transfers knowledge and experience to them. ——— Impact (external) includes **positive action** to retain goodwill.	Impact (internal) affects **a whole sector** in own organisation. ——— Impact (external) includes defence of company actions as well as **positive cultivation** of goodwill.	Actions (internal) affect **whole organisation** (all sectors). ——— Negotiations (external) take place in **dynamic situations** and persuasion must be done in the presence of competitive elements. Establishes a **specific image** of the company..	Impact of actions extends to the **particular business sector** in its entirety (nation-wide). (It is assumed from this level that the internal impact will affect the whole organisation. The score is thus **not** divided by 2.)	Actions have a country-wide influence and may affect the national economy.	Actions can have **international implications.**

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Ø Hardly noticed as a separate function.

FACTOR 6 : COMPREHENSION

This factor assesses the requirements of the post in understanding communications, both spoken and written.

Field of activity : Major function: e.g. Finance, Marketing, Production, etc.

1	2	3	4	5	6	7	8	9
Understanding physical demonstrations of simple manual tasks only.	Understanding simple communication in day-to-day language. Understanding instructions given in short terms and in simple language, incorporating very few simple technical terms and requiring little discrimination.	Understanding simple communications involving understanding a limited number of technical terms (these terms are learnt without much difficulty on the job as they are frequently repeated).	Understanding more varied communications. The communication is essentially simple but a larger number of technical terms and a wider variety of possible activities are involved. (Study other than "sitting next to Nelly" is implied.)	Understanding communications embodied in varied publications. Communications remain simple but their understanding involves a full acquaintance with a limited number of written documents, e.g. technical data, works procedures, safety regulations.	Understanding communications involving specific terminology in a major field of activity. A broad terminology which is used extensively is needed and reference is often made to manuals, and standing instructions, which stress the need to take precise action.	Understanding communications based on the knowledge of varied terminology, covering a number of fields of activity. Communications are meaningful through specific training in a number of techniques in different fields of activity.	Fully comprehending abstract terminology which has developed in a profession. Communications are meaningful to persons who have become familiar with high level abstractions and who must be able to explain difficult passages in esoteric communications to others.	Critical evaluation of original professional communications. Incumbent must read advanced publications critically, evaluate them, and may have to translate these into actions which could change work patterns considerably.

0 0,5 1 2 3 4 5 6 7 8 9 10 13 14 17 22 23 30 42 54 75 96 133 170

Ø Does not necessarily understand; only does as instructed

FACTOR 7 : EQUIVALENT EDUCATION QUALIFICATIONS (or INTELLIGENCE LEVEL REQUIRED IN THE POST)

1	2	3	4	5	6	7	8	9
Sufficient for reading, writing and counting.	Standard 6.	Junior Certificate. NTC 1.	Senior Certificate. NTC 3.	Post-matriculation Certificate/Diploma (1 - 2 years post-matric). NTC 5.	Bachelor's Degree (3 years post-matric). (Some theory and interpretation involved).	Honour's Degree (4 years post-matric). (Significant need to theorize).	Master's Degree (5+ years post-matric). (Developing concepts).	Doctor's Degree. (Original contributions in concepts).

0 0,5 1 2 3 4 5 6 7 8 9 10 13 14 17 22 23 30 42 54 75 96 133 170

Ø Unqualified in basic communications: follows demonstrations

FACTOR 8 : TRAINING/EXPERIENCE (NECESSARY TO PERFORM JOB COMPETENTLY)

This factor measures the period normally required on other jobs and on this job before becoming proficient.

1	2	3	4	5	6	7	8	9
Less than one week.	Less than one month.	Up to one year.	Up to two years.	Up to three years.	Up to six years.	Up to ten years.	Up to fifteen years.	Over fifteen years.

0 0,5 1 2 3 4 5 6 7 8 9 10 13 14 17 22 23 30 42 54 75 96 133 170

Ø No formal training needed: follows direct instructions.

DEFINITIONS FOR USE WITH THE JOB RATING SCALE

Abstract clues: High level abstractions	Where the information used to come to a decision cannot be exactly verified as fact. For instance in long term planning, future interest rates, market fluctuations, labour market movement, government policies, multiple feasibility studies, etc., involving the creation of mathematical models. These require the use of abstractions and conceptualisation in varying degrees.
Business sector environment	These terms imply that an impact will affect not only ones own organisation, but will have a significant impact on competitor's activities. When considering this aspect it should be clearly demonstrated that an incumbent's decisions will have this effect.
Discipline	This connotes a major function such as engineering, finance, marketing, personnel, production, etc. at the full professional level. For instance a bookkeeper's function is not a full discipline.
Interdisciplinary	This implies that the job involves the need to comprehend, in depth, more than one discipline, and to need to be able to use this comprehension in the decision making environment. For example, a managing director will use interdisciplinary understanding to re-synthesize the information from his experts when reaching his decisions.
Professional	Implies that the job requires the use of theory and principles in varying degrees. The job is not just pragmatic, but requires the understanding of concepts and their use in decision making.
Master	Implies a greater use of conceptualising than that needed at the professional level. Probably a "back-stop" to a team of professionals at a high level.
Major field	A major field of activity may be equated to the professional level in a discipline – see discipline above.
Authority within own country	The job requires that an incumbent will be at a level beyond the professional level and when his peers recognise the "job holder" as an authority at a high level: superior in his field nationally. A word of caution – is it the man, or the needs of the job?
Section	Part of a division, or part of a sector, internally.
Sector	Either a division (administration, finance, marketing, production, personnel) within a company, or a significant part of an organisation; e.g. a large branch, or a significant geographical location.
Whole organisation	When quantifying at this level assess the possible effect of your organisation on the next definition which is the "environment" or "particular business sector". This will bring the "whole organisation" into perspective. When looking for a score at this level, consider how "the whole organisation" will affect the next definition. The incumbent's impact can thus be equated to the effect of his decisions on your organisation, in all sectors (internally).
Specialised training	Not just attending seminars, but in-depth training: for example an M.B.A., a computer course, and the like.
Substantial reduction in profit	Will have an effect on a significant operation and will be noticeable on, for instance, the annual balance sheet.
Seasonal fluctuations	Variations for which plans can be made.
Unforeseen deadlines	For which specific plans cannot be made.
Esoteric communications	Those which can only be understood by the initiated, at the professional level, and which a "layman" would have to have explained in ordinary terms.

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4. SPECIALISATION, PROFESSIONALS AND BUREAUCRATISATION

The rapid growth of technology in this century has led to an explosion in the number and variety of people needed to provide patient care in the health field. This is particularly true of academic hospitals where adoption of the newest technical developments and the pursuit of excellence are perceived as being integral to the academic function. As a result, the categories of medical, nursing, paramedical and technical staff have proliferated rapidly as have the support personnel needed to operate and maintain complex equipment and plant. The requirements for increasingly knowledgeable and skilled personnel have led to the absorption of large numbers of knowledge workers into the hospital service. This has led to a revision of many traditional public service concepts regarding lifelong careers, identification with institution rather than profession and conformist orthodoxy, as greater mobility and professionalisation have altered personnel attitudes to organisations.[1] Increasing specialisation has also contributed to escalating hospital costs as more skilled and highly qualified personnel demand better facilities and higher salaries. Greater complexity and improved quality and availability of health services have accentuated both the need for additional personnel and functional diversification.

SPECIALISATION

The variety of personnel in the hospital includes a wide range of specialists in many fields, particularly in the Professional and Technical divisions. The steady growth of new categories of specialists in medicine has led to an increase in the number of registered specialties from 16 in 1939 (the first year in which specialists were registered by the South African Medical and Dental Council) to 32 in 1977.[2] There are, in addition, approximately 30 recognised subspecialties. The variety of specialised scientists working at Groote Schuur Hospital--microbiologists, bioengineers, medical physicists, biochemists, clinical psychologists, statisticians and other disciplines such as computer scientists, pharmacists and dietitians also increases steadily, as do the categories of paramedical workers, technicians and technologists in the Technical Division.

In the Nursing Division, specialisation is also apparent and the S.A. Nursing Council now recognises 17 post-basic certificates and diplomas--including courses in operating theatre technique, orthopaedic nursing, paediatrics, psychiatry, spinal cord injuries, intensive care, nursing administration, and for Nurse Tutors.[3]

Specialists can only be efficiently employed in large organisations or combinations of organisations, where there is sufficient work for them to be fully utilised in their particular field--the economies of scale--and where less highly trained people are available to take over clerical and other non-specialist jobs. This is particularly true of the large, complex, general teaching hospitals which have high levels of functional specialisation and medical technology, departmental fragmentation and professionalisation and which can therefore utilise the division of labour to increase productivity and efficiency.[4] Centralisation of specialist expertise in a Regional institution, serving a wider area, is the most effective and economical way of employing specialists.

Effects of Specialisation

Groote Schuur Hospital is typical of these complex organisations, employing large numbers of specialists in a variety of departments, sections and units, each dedicated to the performance of specific tasks or the treatment of designated groups of diseases or organs. The effects of specialisation on the Hospital organisation can be considered in four categories.

1. Differentiation of function and the utilisation of manpower
2. Costs
3. Co-ordination and control
4. Decision-making

1. Differentiation of Function and Utilisation of Manpower--Classical organisation theory as expounded by Urwick, Taylor and others stated that division of labour and functional differentiation is essential to increase efficiency.[5]

In small institutions where one person can be responsible for several different functions there is limited differentiation--but increasing size of organisation leads to increasing division of labour and the supposition that both efficiency and economy are enhanced by greater size.[6] Conversely, with increasing specialisation there is a need for increasing size of organisation to accommodate the specialists and ensure that they are fully utilised and not

wastefully employed in an inappropriate manner.[7]

Specialisation, however, precludes interchange of personnel from one functionally differentiated unit to another and creates particular problems with technical staff who are trained in highly specialised fields such as cardiac catheterisation, electro-encephalography, dialysis or pulmonary function. Technicians cannot be easily transferred between these units as required, nor does their present training promote functional flexibility as recommended in the Zuckerman report.[8] The training of technologists both laboratory and clinical, is under review at present and consideration should be given to providing a common basic course which will facilitate transferability of technical staff from one specialty to another and improve utilisation of their skills and knowledge.

Similar problems occur in other services where specialised personnel are not fully occupied at all times but must be available immediately if needed--in emergency departments, theatres, X-ray departments and elsewhere in the hospital. Some redundancy is essential in acute hospitals but flexibility in the utilisation of personnel should be planned to avoid wasteful allocation of this costly resource.

2. Costs of Specialisation--In most instances, specialists (particularly professionals) in the hospital service earn higher salaries than generalists. Highly qualified specialists are also expensive to train and consume more resources than other hospital employees. They also require expensive facilities in which to perform their specialised functions.

The capital and operating costs of the organisation increase exponentially with the increasing differentiation of the activities undertaken by the hospital. Control of costs generated by specialisation encompasses the whole field of avoidance of waste and cost containment but particular attention should be paid to ensuring that specialists are appropriately employed and not involved in routine tasks which could be performed, as effectively, by lower grade staff.

> the objective is to increase the productivity of all levels of manpower by assigning functions to the least skilled and lowest paid occupational groups trained to perform the particular task.[9]

The consequence of this policy however, is the employment of increasing numbers of "unskilled" workers whose motivation and productivity are low and who, in obedience to Parkinson's Law are usually too busy to fulfil the function for which they were appointed, as their work expands to fill their idle hours.[10]

If management is able to control the development of specialisation (which it may not be), the economic benefits of division of labour need to be carefully weighed against the increased consumption of resources by specialists and the hidden costs engendered by delegating routine tasks to less skilled and less efficient workers.

3. Problems of co-ordination and control--The greater the degree of differentiation and specialisation the more necessary it is to co-ordinate the activities of many functional groups and to ensure that they are working towards a common goal. Specialists tend to be more concerned with the welfare and goals of the group to which they are attached than to the job to be done or to organisational goals.[11]

Effective co-ordination is essential to overcome these tendencies and to avoid or resolve conflict between competing specialists. Charismatic professionals, inherently committed to the division of labour and professional autonomy, require considerable co-ordinating and administrative effort. Gross describes professional intransigence thus--

> The strong sense of one's own competence will necessarily result in an unwillingness to accept orders or follow rules. Hence the professional will insist that he knows best ... and that the rules of the organisation are just so much red tape that gets in the way of the attainment of professional goals.[12]

In their own functional activities, however, specialists may be self-regulating and can effectively co-ordinate their own activities without external control.[13]

4. Decison-making--Much of the decision-making in professional organisations is decentralised, and participation in planning and policy-making, as well as decisions on resource use, occur at a fairly low hierarchical level. This effectively brings about specialisation in the work of making decisions so that, optimally, each one is made at the point in the organisation where the greatest expertise is available.[14]

The presence of large numbers of professional specialists in hospitals is accompanied by pluralist and collegial attitudes to decision-making. Accommodation and a process of mutual partisan adjustment tend to predominate, rather than rational and quantitative methods. As competition for scarce resources increases, however, specialists are compelled to adopt less subjective modes of decision-making and have to participate in more "scientific" processes in regard to planning and resource allocation. Their participation in this way is not only of value to the organisation but also adds to the satisfaction and

rewards of the participants and enhances co-operation and co-ordination. A more detailed study of the decision-making process at Groote Schuur is presented in Chapter 6, but it is worth noting here that the decision-making processes in a hospital are, by the nature of the service offered and the expertise of the participants, very widely distributed at the operating level.

PROFESSIONALS AND PROFESSIONALISATION

Professionals form a significant percentage of the workforce at Teaching Hospital (10% in the Professional Division--but ± 32% if trained personnel in the nursing and technical divisions are included) as shown in Figure 4.1. It is therefore important to understand the concept of professionalism, which occupations qualify as professions, and the effect of professionalisation on the organisation.

Category	Number of Qualified Personnel	Total Number of Employees	Percentage of Total Staff
Professional	644		10,9
Technical	422		6,1
Nursing	908		14,9
TOTAL	1 974	6 088	32,4

FIGURE 4.1 Groote Schuur Hospital Group: Percentage of Professional personnel (1976)

Professionalism has developed from the ancient cult of elitism and was confined initially to the three 'learned' occupations of divinity, law and medicine.[15]

Characteristics of the Professions

Professionals are a limited high status group--characterised by certain well-defined core traits--

1. There is a basic body of abstract knowledge over which the profession has guardianship. This special knowledge is acquired by formal training in a body of theory--each profession exercising judgement over the validity of such knowledge and controlling its dissemination. This

knowledge is created or applied rather than communicated.[16]

2. The formal training period is never less than 5 years and includes a period of intensive practical apprenticeship during which professional commitment is inculcated. This process is described by Greenwood as an 'acculturation process' which transforms the neophyte into a professional by internalisation of "the social values, the behaviour norms and the symbols of the occupational group."[17]

3. They have autonomy and authority--based on the body of knowledge--which is characteristically not subject to supervision or control by administrative authority or external regulation. They can exercise independent judgement.[18]

4. There is commitment to an ideal of service and to a code of practice and ethics which is administered by a member-elected controlling body. Members of the profession must be registered in order to practice and can be de-registered. They are members of a moral community basically responsible to their consciences and exercise punitive control over violations of the ethical code by other members. Each professional community is cohesive, homogeneous and self-regulatory.[19]

5. They exercise a monopoly over their chosen tasks and require imagination, initiative, creativity and innovativeness to perform these tasks optimally. Tasks are generally speaking not routine and are delegated to subordinate occupations once they become routinised.[20]

6. They are frequently concerned with matters of life and death--and are usually protected in the work situation by the guarantee of privileged communication.[21] Both these statements are relative and variable, depending on the particular profession and the laws of the country.

Using these criteria, none of the so-called professions working in the hospital, with the exception of medicine, qualify for the title--thus excluding nurses, paramedicals, social workers, clinical psychologists and scientists. Few are in fact professions according to Etzioni (writing in 1969) but should rather be called semi-professions.

> ...we shall refer to these as semi-professions. Their training is shorter, their status is less legitimate, their right to privileged communication less established, there is less of a specialised body of knowledge, and they have less autonomy from supervision or societal control than 'the' professions.[22]

This statement still holds true for many of the Supplementary Health Service professions but a few, particularly clinical psychologists, are moving towards full professional status.

The Continuum of Occupations

Greenwood clarifies the issue of professions and semi-professions by describing the occupations in a society as being distributed along a continuum, with the established professions (medicine, law, architecture) occurring at one end and the unskilled manual occupations being placed at the other end. The remainder are spread between the two extremes. If this concept is applied, it becomes unnecessary to create a sharp distinction between professions and semi-professions and all occupations can be considered as a gradation from one extreme to the other, which is more applicable to 'real' life.[23]

To clarify the matter further, nursing will be considered in some detail.

The Nursing Profession

The constant striving of the nursing profession for true professional status is well documented and is marked by increasingly valid claims to autonomy.[24] In the intensive care unit, the family planning clinic, the rural district nursing clinic or outpatient department, the registered nurse is now diagnosing and treating in her own right. The legal and statutory barriers which confined nurses to handmaiden status are crumbling and as clinical nurse specialists they are achieving independence and professionalisation.

Professionalisation and role expansion of nursing is proceeding apace in extra-hospital and rural situations as a measure to relieve the medical manpower shortage and to contain costs. The clinical nurse specialist is also receiving recognition as an autonomous professional in academic and other hospitals, as doctors delegate, increasingly, more of their routinised tasks to the nursing profession.

Effect of Professionalisation of Nurses

The upgrading of the nurses role will have profound effects on hospital organisation which are considered with reference to Groote Schuur Hospital.

Efficiency of the Service--The major functions of an academic hospital are patient care, service to the community, teaching and research. These objectives must be achieved as efficiently and economically as possible. The changing status of the nurse will affect primarily patient care and community service, and it will be the responsibility of hospital management to ensure that nursing professionalisation improves the quality of care and service provided by the hospital. If the clinical nurse specialist is to assume some of the functions of the doctor, duties must be reallocated in accordance with the best interests of the patient and the capabilities of doctors, and the most effective utilisation of their special skills, must be very carefully assessed. It is not only the most technical therapeutic activities for instance, that require medical training. The first appraisal of the patient--the critical point of initial contact--is equally demanding of professional medical skills as it is at this stage that vital decisions are made regarding the patients' physical, psychological and social needs which require special attention. If decision-making on patient care at this point is delegated to personnel with lesser qualifications and training, the ultimate outcome of the patients' encounter with the hospital may be prejudiced and the entire system function less effectively. This important issue requires careful comparative research and evaluation.

Career Structure--The present structure of the nursing staff organisation compels the bedside nurse, who seeks status and financial security to forsake clinical nursing and enter the administrative or teaching fields. There are no 'top-jobs' for clinical nurses in any health care organisation.

Posts of Principal Sister (equivalent to Senior Matron) were created recently as the result of a study by Sanders and her preliminary report to the Director of Hospital Services,[25] which has improved the career structure for the clinical nurse, but she is still excluded from the higher echelons of the nursing hierarchy. The situation is similar in the United Kingdom following the recommendations of the Report of The Committee on Senior Nursing Staff Structure (The Salmon Report), in which 10 grades of nursing posts were proposed. The three highest grades are administrative or teaching posts.[26] The result of forcing the ambitious bedside nurse into the

administrative or teaching fields in order to gain promotion, is possible role conflict for the nurse herself, with ensuing strain, tension and potential diminution of productivity and efficiency.[27]

The career structure for the clinical nurse specialist, nurse practitioner or clinical nurse consultant must be defined and her place in the nursing hierarchy and the patient care team clearly established, with promotion opportunities and salary equal to those of the administrative nursing grades.[28]

Autonomy and Responsibility--The clinical nurse specialist should be given--and must accept greater responsibility for independent decision-making other than in the nurturent role. This assumption of 'medical' tasks will have far-reaching effects on manpower utilisation and on the division of labour in the hospital which have been well described by Christman.[29] One can speculate on the one hand, that the 'new' nurse--fully professionalised--will become autonomous, independent,intolerant of bureaucratic controls and less concerned with overall hospital objectives but committed instead to the goals of individual departments like her medical colleagues. Conversely, the nurse may transfer to her new role the bureaucratic functions traditionally performed by the nursing staff, carrying out as at present, the functions of the bureaucratised professional, which are so essential to the effective management of the hospital.[30]

Legal Status--If the clinical nurse specialist is to become more autonomous, existing legal barriers must be removed. S.A. Nursing Council regulations permit the registered nurse to perform any function, within the therapeutic programme for which she has been trained. The nurse is personally responsible for her own actions but is not supposed to act except on 'Doctors orders' other than in an emergency. Midwives are exempted from this ruling in certain circumstances.[31] This condition perpetuates the subordinate role of the nurse and a change in the regulations must be made to enable the new professional to act independently.

Training (Basic)--The teaching of student nurses should move away from the 'block-system' where nurses move in and out of the hospital--en bloc--to college and back again. The Medical Student model of integrated teaching and practice should be utilised for nurse training, to avoid the separation between theory and practice which exists at present. University training of nursing students has already moved in this direction but is not yet

sufficiently integrated with ward practice. Teaching programmes should be revised with this in mind.[32]

Training (Post-basic)--The administrative nurse, whose essential co-ordinating and correlating role will be discussed at a later stage, must have a Diploma in Nursing Administration to be appointed to a senior administrative nursing post at Groote Schuur Hospital. This course has been upgraded to a university post-basic diploma in several centres which enhances the potential of these graduates to develop the innovative and creative attributes of true professionalism.[33]

In the administrative field also, the possibility of the professionalised nurse-administrator becoming less bureaucratised must be considered. The hospital is wholly dependent on the co-ordinating, controlling and integrating functions of the Matrons whose concern is holistic as regards the hospital rather than departmentalised or fragmentary. Professionalisation of the administrative nurse should enhance her function as regards realisation of organisational goals, and dedication to the role in the hospital which nursing personnel are uniquely qualified to fill.

> ...namely to ensure that patients receive the quantity and quality of nursing care that they need, at the place and time they need it, and that this care should be free from risk. This is the core function of the nurse administrator.[34]

Interprofessional Relationships--The expanded role of the professional nurse will also affect her relationships vis-a-vis other professional and semi-professional staff, especially doctors. Doctors will have to accept and be able to adapt to the autonomous and self-regulating nurse or conflict will arise. Studying the present situation, where increasing numbers of nursing personnel are specialising in various fields--stomatherapy, blood separation techniques, intensive care, psychiatry, and as paediatric associates and anaesthetic assistants--and are encouraged and welcomed as colleagues by the medical staff, it is not anticipated that serious problems will arise, but this is a subjective view and developments will require careful monitoring and co-ordination.

Initiative, competence, willingness to accept responsibility for clinical decision-making, and a spirit of independence combined with intellectual ability and technical skill, will open the doors to true professionalism for the nursing personnel both in and beyond the large academic health-care institutions.

Job satisfaction--The frustration of the clinical nurse specialist is an aspect of professionalisation to which leaders of the profession will have to give serious consideration, particularly in hospitals, where many tasks which these nurses may consider themselves competent to perform are still the responsibility of junior medical staff.

In hospitals where there are no interns, the presence of these highly trained nurses will be of immense benefit to the patients and the nurse specialist will find work in this situation fulfilling and satisfying. As a result clinical nurse specialists, having acquired the necessary expertise at academic hospitals may move out, on completion of their training, to other institutions where they will be better able to utilise their skills and professional judgement. This could deplete the training hospitals of qualified nursing staff unless precautions are taken to ensure that the non-monetary rewards in the training hospitals are as great as those in rural and peri-urban institutions.

Professionals versus the Organisation

The view is widely held that conflict between professionals and the organisation is inevitable in a bureaucracy.[35] Assuming that the organisation is best served if the goals and norms of the organisation are subscribed to by all participants, it follows that any group within an organisation which is pledged to serve independent and possibly different sets of goals and norms, will inevitably act, at some stage, in a manner which is at variance with the organisation's own objectives. Professionals form such groups, bound by allegiance to professional organisations and codes of conduct, which may take priority over the demands of the organisation employing the professional. The latter are task-orientated, highly mobile and are not usually bound by loyalty or career opportunities to the organisation, in contrast to the administrative hierarchy who are predominantly organisation orientated.

Conflict may also arise between authority based on professional knowledge and that based on the bureaucratic hierarchy; centralisation of power and control favoured by bureaucracy and the professional's need for decentralised autonomy and self-regulation; and as role conflict in individuals with dual functions.[36]

> "... conflict arises from growing inconsistencies between specialist and hierarchical roles."[37]

Hospitals are, however, wholly dependent on their professional employees for accomplishment of organisational goals and health professionals are increasingly dependent on hospitals for facilities, equipment and other specialists to pursue their own objectives. Professionals are thus induced to tolerate the demands of bureaucracy[38] and the organisation must learn to accommodate the professional's requirements for clinical freedom and independence.

Conflict

Suppressed or unresolved conflict is particularly damaging in hospitals, resulting in organisational stress, tension and loss of morale. Ways and means of resolving conflict must be actively sought even if this is at the expense of bureaucracy and flexible, pluralistic modes of management should be developed with decentralised, polycentric structures which encourage participation of the professional in management and top-level decision-making. Increased professionalisation of administrators will also facilitate conflict resolution.[39]

At Groote Schuur Hospital, conflict between professionals and bureaucracy is becoming more apparent as centralisation of control and bureaucratic inroads into professional autonomy increase. This is manifested by open criticism of the administration, forceful protests against administrative attempts to control prescribing and other clinical practices, indifference to administrative appeals for more rational resource use, formation of pressure groups, and increased turnover of medical staff.

Participative management has been tried at Groote Schuur Hospital with varying degrees of success. There are individuals who do not wish, or see no need to become involved, and others who actively resist the commitment. The few who do actively participate make a valuable contribution and derive satisfaction from their achievements. Delegation of responsibility for finding solutions to problems created by scarcity of resources, or for achieving desired goals, has not been successful, but continued effort is essential if the professional staff's ability and expertise is to be fully utilised. New techniques for gaining co-operation and for generating enthusiasm for administrative goals must be sought while allowing professionals, at the same time, the autonomy and freedom they value so highly. Conflict is not necessarily harmful, but it must be legitimised and controlled. Careful analysis of the causes of covert and overt conflict will, optimally, lead to resolution and more effective accomplishment of hospital goals.[40]

Bureaucratisation of Professionals

The impact of the organisation on the professional is an important factor in the management of hospitals. Inevitably, some professional employees become bureaucratised by the demands of the hospital for conformity, compliance and dedication to organisational goals.

> The word bureaucrat has many connotations--but to the extent that bureaucrat has any common meaning, it refers to a person performing specialised but more routine activities under the supervision of officials in a hierarchical fashion[41]

The concept of bureaucratisation of professionals may, therefore, be taken to refer to the degree to which members of a profession are integrated into the organisation structure in supervisory and administrative roles.[42] The bureaucratisation of nurses has been studied in detail by Heydebrand who describes them as the "production component" in the hospital, forming part of the administrative line of authority.[43]

The Bureaucratic Nurse

An examination of the nursing staff function at Groote Schuur Hospital indicates close conformity with Heydebrand's description. The hierarchy of the nursing organisatiom; the system of nursing staff supervisory controls; the role of the nursing staff in regulating and co-ordinating most of the activities in the hospital; and their assumption of a large amount of bureaucratic authority--is an essential component of the hospital management system. The nursing staff in Teaching Hospital are responsible for delivery and co-ordination of patient care, administration of all wards, theatres, intensive care units and outpatient clinics. They control all housekeeping activities and domestic staff, laundry (despatch and receipt) and linen bank, and administration of the central sterile supply depot. They are partially responsible for catering (ordering and serving of meals to patients), for a large amount of personnel work (relating to nurses, housekeepers and domestics), and for a significant proportion of nursing education, as well as supervision and control of all student nurses and midwives in the Group. In addition, they run the central equipment store, are directly involved in the requisitioning, use, maintenance and condemning of many items of equipment, are concerned with planning of accommodation and services and the integration of many other aspects of hospital activity.

As stated previously increasing professionalisation of nursing personnel--both clinical and administrative--will tend to conflict with the inherently bureaucratic function of qualified nursing personnel in hospitals. Two alternatives face the profession.

1. They can become totally professionalised and relinquish their administrative, supervisory, integrative role to lay personnel of various categories--or

2. They can expand their role, participating more fully in high-level policy and decision-making and extending their activities in all directions and at all levels.

The latter is the choice made by Searle for the profession in South Africa[44] and certainly--for as long as nursing remains a comparatively poorly paid occupation--this will be the most effective and economical solution. If the fully professionalised nurse is remunerated at a more appropriate level, in keeping with her qualifications and skill, then it may become necessary to delegate more of the general administrative functions, presently performed by the nursing staff, to other less highly paid and more available personnel. The possible consequences of this transfer of responsibility to less skilled, less efficient and less dedicated categories have been discussed previously.

Bureaucratisation or Professionalisation of nursing personnel has a more marked effect on the activities of the hospital than do similar trends in other categories of staff--due to the large number of nurses working in the hospital (1/3rd of the total staff) and to the importance of the nursing function in achieving the prime hospital goal of patient care.[45] Comparative analysis of the other professions, particularly those which are preponderantly female would be rewarding and might provide much needed insight into ways of improving management of women as employees. This research is beyond the scope of the present work.

THE HOSPITAL ADMINISTRATOR--BUREAUCRAT OR PROFESSIONAL?

To conclude this discussion on the subject of bureaucrats and professionals, the role and qualifications of the hospital's chief executive require examination.

The Hospitals Ordinance states

> The control and supervision of every provincial hospital shall be vested in a whole-time or part-time Medical Superintendent...[46]

This pertains in all Provinces--not only the Cape--and in all State and Local authority hospitals throughout South Africa.

A World Health Organisation survey on Hospital Legislation and Hospital systems in 1973 reported that--

1. Twenty-seven of the forty-seven reporting countries indicated that their hospital directors were doctors without clinical duties.

2. Fourteen countries reported that all hospital directors were doctors with combined clinical and administrative duties.

3. Twenty of these forty-one countries reported the use of lay administrators as well as medical directors.

4. Three countries reported that hospital administration was the joint responsibility of medical and lay administrators.

5. Three countries reported that all hospital directors were lay administrators without any medical participation in the management process.[47]

This report indicates that medical superintendence is still generally accepted practice in the majority of countries studied.

In the United States and Britain, since the Second World War, the tendency has been to appoint lay hospital administrators in preference to Medical Directors or Superintendents, except in mental and psychiatric hospitals.[48] When the National Health Service was introduced in Britain in 1948 the position of Medical Superintendent in general hospitals was virtually abolished. This action was subsequently endorsed by the Bradbeer Report of 1954.[49] The Bradbeer Report and the First and Second Cogwheel Reports, examined in depth alternative means of organising medical staff and of involving doctors in the administration of hospitals.[50] In the United States, the Joint Commission for Accreditation of Hospitals issued, in 1971, recommendations for the institution of Medical Committees to formulate medical policy and to facilitate liaison between medical and other staff.[51]

These reports and proposals are very similar in nature and arose from the need to have a structured medical staff system which was not subject to the authority of lay hospital administrators. It is clear that organisation of medical staff in hospitals, where the chief executive is non-medical, poses many problems and the solution in most instances has been the creation of a

dual hierarchy/dual authority system, where the medical staff function as a completely independent group within the hospital organisation.

In the United Kingdom it is clear, however, that this situation proved unsatisfactory and the need for Medical administrators was emphasised in the Hunter Report, which discusses the requirements for their training and specified their role as one which was essentially complementary to that of clinicians and lay administrators.[52]

In the Reorganised National Health Service (1974) the concept of consensus management, that is decision-making by agreement between all parties concerned rather than by majority vote or decree, was implemented, with the intention that no one discipline should be dominant in the administration of a hospital or health service but that management should be based on a collegial model and decisions made by mutual accord.

The need for medical administrators to assess the need for services; to provide information to clinicians for decision-making; to keep the balance between competing empires; to investigate, plan and develop new services; to improve relationships between community, hospital and governing authority; and to assist clinicians in the fulfilment of their managerial responsibilities has been emphasised by McKee and others.[53]

Various reports in the literature indicate that the problem of who is best qualified to be the hospital's chief executive officer have not been resolved since Smith wrote his classic article.[54] There is conflict between medical, nursing and lay administrators and governing bodies. Dual hierarchy systems impose heavy strains on relationships between bureaucratic and professional structures which are inherently inimical. The medical administrator as a chief executive may reduce organisational conflict by absorbing strain and tension before it reaches the organisation but is subjected to personal role conflict as a result, with loss of specificity and clarity of the chief executive function.[55]

The solution to conflict between hospital professionals and bureaucrats and to the problem of which qualifications are required for the chief hospital administrator, almost certainly lie in professionalisation of lay administrators and training of medical professionals in administration.[56]

There is no specific training for hospital administrators in the Republic. Cloete claims that the small number of people requiring to be trained as hospital administrators does not justify the establishment of

specialised academic courses.[57] The need for professionalised lay administrators is, however, so critical to the effective management of hospitals that it is considered that this matter should be further investigated. Proposals for a post-graduate Fellowship of the Faculty of Community Health (Administrative Medicine) have been submitted to the South African College of Physicians and Surgeons which will provide the first course of this kind for medical administrators in the Republic, fulfilling a long-felt need.[58]

The role of the Medical Superintendent at Groote Schuur Hospital is a complex one. Supervision and control of all hospital activities does not include the teaching and research functions of Joint Staff--nor does the Medical Superintendent interfere with the clinical autonomy of the medical staff. Representative and head of the bureaucratic, administrative hierarchy yet professionally allied to the medical personnel the Medical Superintendent is indeed subject to severe role conflict and divided loyalties. The onerous task requires exceptional administrative and professional competence as well as high-grade, professionalised, administrative colleagues and supportive, participant medical staff, who understand and accept their own managerial responsibilities. There is a very great need for suitable training of medical and non-medical administrative staff to satisfy these requirements and to ensure effective co-ordination of all hospital activities.

SUMMARY

Modern hospitals employ an ever-increasing variety of specialists, necessitated both by the inevitable division of labour and by the need for high grade skills and expertise to perform dedicated tasks in an advanced technological environment. Knowledge in the medical and allied sciences has expanded with overwhelming speed compelling individuals to concentrate on specialised fields.

Increasing specialisation has led to increases not only in complexity but also in size of hospitals to enable the economies of scale to function, with centralisation of skills and equipment. Concomitantly, costs have risen, effective utilisation of personnel has diminished, co-ordination and control requires increasing managerial effort and decision-making has become more decentralised and polycentric.

Many specialists in the hospital are professionals with well documented characteristics and goals which are diverse and not always congruent

with those of the organisation. Professionalisation of various disciplines brings many problems as well as benefits in its train and the effects of professionalisation of the nursing staff in particular, will have wide-ranging repercussions on hospital organisation.

Conflict between professionals and the organisation may be the cause of organisational stress and tension and requires legitimation and the development of new managerial techniques and skills for its resolution. Unresolved or suppressed conflict may seriously damage goodwill, motivation, morale and achievement of organisational goals.

The bureaucratisation of professionals, particularly of nursing personnel has led to increasing use of trained nursing staff in administrative and supervisory roles. The nursing hierarchy perform all the important co-ordinating and controlling functions in the provision of patient care in the hospital. Professionalisation of nurses may well disrupt this traditional pattern of hospital management resulting in delegation of many general administrative duties to less well qualified staff. The results of this change have not been fully considered or evaluated.

The role of the chief executive in the hospital and the qualifications necessary for this position have been debated extensively and several alternatives have been proposed. The need for some form of medical organisation to control medical staff, who are not answerable to a lay administrator, has led to the development of dual hierarchies, the appointment of medical directors, or some form of collegial triumvirate in an attempt to avoid or resolve conflict between the organisation and professionals. No completely satisfactory solution has yet been found. It is suggested that the answer lies in training doctors as administrators and in developing a professionalised, non-medical administrative corps. Collegial Top-management, with medical, nursing and lay administrators, could then be effectively implemented.

Many important aspects of manpower as an input to the hospital system have been omitted from the discussion in these two chapters. The selection of topics for inclusion has not, however, been entirely arbitrary and is based on their relevance to clearer understanding of the needs, roles, values and interaction of hospital personnel and the search for more effective methods of utilisation and management of this costly resource.

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5. BUILDINGS AND PLANT - EQUIPMENT AND SUPPLIES

BUILDINGS AND PLANT

The requirements for the physical environment of hospitals have altered radically in this century. The technological advances which have taken place, particularly since the Second World War, have necessitated a complete revision of the approach to new hospital buildings and to the plant and engineering services which are essential to the functioning of these complex institutions. Hospitals built and designed within the last thirty years are already obsolete, modernisation tends to be uneconomic, while hospital building costs have skyrocketed. The problems facing health care administrators are the provision of essential facilities despite rising costs and limited resources and the need for careful consideration of several factors which influence planning.

Expanding Needs

The demand for highly differentiated and specialised areas within hospital buildings has followed the steadily increasing specialisation and super-specialisation of medical science itself. Table 5.1 gives an indication of the proliferation of services which has taken place in the ten-year period 1965-1975 at Groote Schuur Hospital.[1]

	Number of Departments and Special Units	
	1965	1975
Division of Medicine	15	21
Division of Surgery	12	17
Division of Obstetrics and Gynaecology	2	6
Ancillary Division	4	5
Division of Radiation Medicine	0	6
Division of Pathology	3	5
Para-medical Services	6	9
TOTAL	40	66

FIGURE 5.1. Groote Schuur Hospital Group: Expansion of Services (1965-1975)

Equally important as regards expanding needs for hospital facilities, is the projected population growth in South Africa. Doubling of the population in the next thirty years to ± 45,000,000 is anticipated[2] which will necessitate the provision of approximately 88,000 to 110,000 additional hospital beds. This estimate is based on the currently recommended South African norm of five beds per 1,000 population and a figure of four beds per 1,000 population, stated by Shain and Roemer to be the average level in the United States in 1959.[3] (The bed rate for the Western Cape in 1974 was 3.68 per 1,000 population)[4] Ambulatory care facilities and other services will need to expand pro rata or to an even greater extent.

Apart from the net increase in requirements for beds and specialised facilities, there has been an accompanying increase in the gross floor space/bed required for modern hospitals. Borup states that in Denmark, this area increased from 22 sq.m/bed in 1863 to 90 sq.m/bed in 1974.[5] The South African Report of the Committee of Inquiry into Norms and Procedures for Hospital Construction--(SAHNORMS), recommended a total gross area of 50-60 sq.m/bed for general hospitals and 80-90 sq.m/bed for Academic hospitals,[6] which is similar to the Danish figure.

Rising Expectations

More facilities are not only needed because of population growth but also as a result of changing consumer attitudes.[7] Provider attitudes, exemplified by the principle of the World Health Organisation that "the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being"[8] have actively promoted the concept of free and equitable access to health services as a universal right. The general public in developed countries now demand sophisticated health care as a right--which health insurance schemes have brought within their reach in some countries e.g. America. In the United Kingdom and other socialist countries in Europe--appreciation of the need for equitable distribution of health care to entire populations, has led to national health services or similar systems for providing health care, which have also led to increased demand and utilisation. Developing and semi-developed countries have different problems but within a generation or less the American and European situation may be experienced in other parts of the world as well. In South Africa, better education will make people more aware of what is available in health care, while a general increase in earning capacity and the proliferation of medical aid schemes will provide a greater number with the means to

pay for it.

Technological Advances

The discovery of new investigative, diagnostic and therapeutic techniques has also had an impact upon the kind of buildings, facilities and services which are required for modern hospitals. Computerised axial tomography and other sophisticated image-visualisation techniques; the use of electronic data-processing in an increasing variety of medical applications; the demand for extensive radiological, electronic monitoring and extra-corporal circulation equipment in theatres; the continuing expansion of intensive-care facilities with increasingly complex monitoring and recording devices; the availability of high-powered cyclotron, linear accelerator and other radiotherapeutic machines--and the potential for treating patients with end-stage renal or cardiac failure--inter alia--have stretched the fabric of existing buildings and plant to their limits.

Changing Needs

The need for expansion and development of new technologies has led inexorably to higher costs. The buildings per se are costly, but the services provided are more so. As a result, cheaper and simpler ways of providing health care are being sought. Economic and social pressures are making it possible and necessary for patients to be looked after at home or in the community rather than in expensive institutions.[9] Many investigations and minor operations which previously required admission for several days are now being dealt with as outpatient procedures.[10] Average length of stay in hospital has decreased steadily[11] and several centres (particularly psychiatric and geriatric units) are utilising day hospitals as alternatives to inpatient care. The trend towards domiciliary and ambulatory care is gaining favour in many developed countries where home circumstances and community services are more conducive to such developments.

In underdeveloped countries, these favourable conditions are less prevalent and health care centres are more widely dispersed. Appropriate systems of health care are being developed for these areas, based on local facilities and semi-trained health assistants, but at times hospitalisation is essential for investigation and treatment, necessitating travel over long distances and removal of the patient from the support of family and community. South Africa, which is in an intermediate stage of development, is faced therefore, with the dual problems of a decreasing need for white hospital beds and rapidly increasing demand for inpatient and ambulatory

facilities for the fast growing, largely underdeveloped, black population. Disease patterns and incidence also undergo constant if less dramatic change, necessitating provision of extra facilities and rendering others superfluous as life styles, technology and new drugs affect man, his health and his environment.[12] Furthermore, Governments in many countries are giving preventive Health Services much higher priority and a larger share of resources than in the past--

> When resources are limited it is clear that growth in any particular service can only be made if counter-balancing economies are made elsewhere [13]

This shift in emphasis from curative to preventive services must curtail the funds available to the curative sector for new buildings and sophisticated equipment. This trend is already apparent in South Africa where the need for greater expenditure on primary (preventive) health care is urgent and recent legislation leads the way to further progress in this regard.[14]

Teaching Requirements

Academic Hospitals have a responsibility for educating students in many disciplines. For many years medical schools have been urging the expansion of hospital facilities to make the training of more doctors possible. The needs of the South African community for medical practitioners are seemingly insatiable. In many developed countries, however, there is a sudden and deepening anxiety about a possible over-supply of doctors. In under-developed countries on the other hand, increasing use is being made of medical assistants or nurse practitioners to compensate for the lack of doctors. South Africa is at the cross-roads regarding training of medical and para-medical personnel and decisions concerning the kind of health care personnel to be trained and provision of appropriate training courses and facilities, requires review, analysis and careful planning

The emergence of new disciplines requiring teaching space in hospitals must also be considered, as must existing disciplines with changing syllabi and lengthening courses, to match increasing complexity of machinery and techniques.

Those responsible for the provision of health care--at whatever level--cannot ignore these and other trends and developments--which are as significant in South Africa as elsewhere in the world. Responsibility for the selection of priorities and determination of areas for development, rests as much with those who actually spend the money as with those who allocate the resources.

An awareness of all needs is essential for rational planning and administration.

Spiralling Costs

The cost of all building work has risen steadily in the past 10-12 years. The Building Cost Index, compiled by the Stellenbosch Bureau for Economic Research, shows a rise from 100 in 1970 to 205 at the end of 1976.[15] Overseas reports indicate that hospital buildings costs increased more rapidly than costs for other construction.[16] Almost certainly, similar trends would be shown for the Republic if the information was available. Of greater significance, however, is the relationship between capital expenditure on hospital buildings and the operating costs of hospitals. Borup states that

> A calculation of the number of years operating costs required to balance the initial expenditure for a hospital building shows that, on current prices, 7-8 years operating costs balanced the initial expenditure in the 1910's and 1920's; 5-6 years in the 1930's and 1940's; 3-4 years in the 1950's and 2-3 years in the 1960's. [17]

Information on new building and operating costs is not available, but figures published in SAHNORMS show that the initial capital cost of hospitals represents only a small proportion of the total cost of Provincial Hospital Services, despite the escalation in building costs.[18] (Figure 5.2).

	Transvaal		Cape Province		Orange Free State	
	Capital*	Maint.**	Capital*	Maint.**	Capital*	Maint.**
1964	3,9	32,3	3,1	33,3	0,9	4,6
1965	4,1	33,9	4,2	37,5	1,0	5,4
1966	3,6	36,4	5,1	44,1	0,9	6,8
1967	2,2	40,9	6,9	49,0	0,8	7,3
1968	4,6	44,9	9,8	56,6	1,5	7,9
1969	4,3	54,8	10,3	66,8	1,4	8,9
1970	6,1	63,1	11,8	72,1	1,3	11,3

FIGURE 5.2 Capital Investment in Provincial Hospitals in Relation to Operating Costs (R million)

SOURCE: "SAHNORMS", p.23.

NOTE: * Reports of Auditor General
** Reports of Directors of Hospital Services (the Natal report does not contain these data)

Expenditure on alterations, additions and remodelling of old hospitals is another factor which must be taken into account. Approximately R15,000,000 was spent in this way on the Groote Schuur Hospital Group in the period 1966-1975. The effects of this piecemeal expansion are described by Carner.

> Hospitals have added pieces of structure here and there as best they could. Frequently this resulted in a hodge-podge of building that remains inadequate. While meeting the need of the moment, this does so at very heavy cost both initially and for years to come.[19] (emphasis mine)

The long-term costs of patch work building have not been calculated. In terms of inefficient usage of manpower, equipment and space; duplication of facilities resulting from unavoidable separation of units; and inconvenience and danger to patients due to long distances between theatres, wards and services--the costs must be enormous.

Careful analysis is required to determine the most cost-effective expenditure of funds but it seems more than likely that money spent on new, flexible hospital buildings, in which particular attention is paid to reduction of operating costs, would result in substantial overall savings in the medium to long term. This contention is supported by Borup--

> ..... considering the total consumption of resources for a hospital, we find the initial expenditure declining in importance whereas the operating costs are increasing in importance.[20]

Analysis of Needs

Health Service administrators face considerable difficulties in correlating all these diverse and conflicting factors and in determining the real needs of communities for health care facilities. The SAHNORMS report stresses that this basic decision is far more important than the determination of building norms per se and that the single most important criterion in this regard is -

> The establishment and application of rational need norms based on the demonstrable need for hospital facilities in a particular area.[21]

Furthermore the committee stated that -

> The size of each hospital will depend upon the medical needs of the community and any survey of the needs of the community should include a study of the disease profiles, socio-economic factors, availability of medical and other staff, national and local planning and design policies.[22]

Individual Hospital Needs--Responsibilities of the Planning Committee.

The responsibility for assessing, analysing and determining each hospital's needs for additional or altered accommodation must rest initially with the Hospital Planning Committee.

> A (Planning) committee can function effectively .... if it defines its role clearly and realistically in terms of the new and dynamic relationships that are developing between the hospital and its environment. Environmental analysis and planning provides a clear cut framework for the committee to define its role within the institution and for it to outline appropriate and specific tasks for itself within that role.[23]

Groote Schuur Hospital Group's Planning Committee functions as

1. A forum for Departmental Heads to air and review their needs for additional accommodation.
2. A collegial priority-setting group.
3. A building progress review committee.

It should, however, be the hospital's primary decision-making body as regards long-term planning and allocation of resources--manpower, facilities and services and should not try to combine building review activities with Planning. A Building Committee which maintains surveillance of current building projects, maintenance and repair items should be formed, as a separate committee, but with membership that is interchangeable with the Planning Committee. This committee's duties would include--"supervising" and co-ordinating current major building works; planning, implementation and control of minor works; and co-ordination and control of all activities relating to buildings, plant and site.

Secondly, in regard to the planning of particular facilities, the Planning Committee must not only prepare 5-10 year plans and set priorities, it must also participate actively in the planning process on a continuing basis, ensuring that the original intentions are met or that essential changes are incorporated.

Webber and Dula have outlined the activities of a Hospital Planning Committee and the matters which could or should be dealt with in each activity category, as shown in Figure 5.3.[24]

ACTIVITY	EXAMPLES OF TOPICS TO BE CONSIDERED
External Analysis	National Trends Changes in demography of referral area Changes in regulations Opening of other institutions with related functions
Internal Analysis	Changing treatment policies Changes in medical specialties Changes in technology and techniques Changing medical school and other teaching requirements
Issue Analysis	Services to be offered in the future The Hospital's role in comprehensive health care
Alternative Analysis	Continue as before Expansion of Services Transfer of Services Develop new Services or Terminate existing ones
Implementation and Planning	Decisions re proposed action Procedure to be followed Education of other hospital staff Continuing evaluation

FIGURE 5.3 Planning Committee's Activities

SOURCE: Webber and Dula, "Effective Planning Committees for Hospitals", p. 138.

It is considered that Groote Schuur Hospital's Planning Committee should revise its present functions and develop a new integrated approach to total planning on these lines.

Planning Procedures for Specific Building Projects

Hospital building requires skilful co-ordination of many disciplines and it is essential that a competent planning team be appointed to deal with analysis and planning from the inception of the project. A multidisciplinary team consisting of medical, nursing and lay administrators, clinicians, and technical and "shop-floor" representatives must compile the architects' brief--working to the Planning Committee. Thereafter, the process must follow step-by-step through the appointment of the professional design team, which should include an experienced building contractor (SAHNORMS--recommendation),[25] to

the presentation of sketch designs, acceptance by the client, preparation of working drawings, calling for tenders, awarding of contract, building, completion and handover.[26] When building commences, the commissioning team should be appointed to determine equipment and staffing needs; to programme orders and delivery dates, to arrange for the appointment and training of staff; and to co-ordinate the final move and initial "trial" period.[27]

The planning process is hindered by the factor of "constant change" well-known to any architect who has worked with hospital personnel--

> ... a brief is more often than not already out of date one or two years after it has been prepared.[28]

It is therefore essential that the planning team have real insight into departmental requirements, that the hospital is viewed as a whole and that trends which indicate future needs are constantly reviewed--in particular--

> Undue weight should not be given to the demands of individual clinicians, who may base their requirements on past experience and present accommodation, rather than on anticipated future needs.[29]

Design considerations

There are several factors which are of critical import in designing hospitals. Borup has described these at length and made some cogent and very logical recommendations, which are generally applicable to the South African situation. Flexibility is essential--both internal and external. Modular design facilitates manufacture and assemblage of components, interchangeability of components and later alterations to the building.[30] SAHNORMS recommends that Industrialised building methods which are highly developed in the United Kingdom and the United States be carefully investigated, for use in new South African hospitals.[31]

Plant and Services

The Engineering Services--which may account for more than fifty per cent of the total construction cost[32] must be carefully considered. Air-conditioning, ventilation, lifts, medical gas, emergency power supply, computer cabling, sewerage, electricity, steam and water are essential but precise needs must be clearly defined to avoid redundancy, and easy maintenance, repair and replacement must be a prime consideration. Mechanical transport systems, call systems (doctors, patient-nurse), radio diffusion and television facilities all require assessment and detailed planning.

Safety requirements, including fire precautions, deserve meticulous attention and accessible fire escapes, automatic door closers, smoke detectors, sprinkler systems and alarms are essential. Scavenging of anaesthetic gases is now considered essential to protect theatre staff from the long-term effects of these gases. Grounding of electrical appliances and a multitude of other regulations must be complied with and the dangers of flammable gases guarded against.

Care must be exercised in the over-enthusiastic application of regulations. Recent evidence shows that stringent requirements regarding use of isolation transformers and grounding of electrical equipment in intensive care units have been overstated.[33] The expenditure on this possibly unnecessary precaution has been considerable to date and such requirements should be critically re-assessed.

Infection Control is an important consideration in hospital design which must be remembered at every stage of the process, to reduce nosocomial infection and to protect patients and staff from unnecessary and possibly life-threatening illness.[34]

Planning the New Groote Schuur Hospital

The objectives of the design process must be the attainment of as many of the client's requirements as possible. Needs must be met economically and efficiently and patients and staff must be provided with a safe and pleasant environment. Operating costs should be reduced to a minimum by good design and incorporation of efficient transport and communication services. Maintenance costs must be minimised by selection of high quality plant, ease of access to installations and durable, easy-clean finishes.

A new building complex is being planned for Groote Schuur Hospital which will accommodate surgical wards and departments and a variety of services and staff facilities. The old hospital is to be remodelled. This is the first Academic Hospital to which SAHNORMS will be applied and the control of both size and costs to conform with the recommended norms is a difficult exercise. It is essential that individual departmental demands are subjected to scrupulous and objective peer-review and that the final allocations are justifiable and equitable. The political uncertainties and economic difficulties which face the Republic necessitate meticulous analysis of needs--community, Hospital and its associated Medical School, to ensure that ultimately the buildings meet the needs--and meet them economically.

Operations Research

Quantitative techniques for use in Hospital Planning, which are applicable to the analysis and design process, are available which should be utilised to facilitate achievement of these objectives.

Planning information requires both quantitative and qualitative input. Historical data and projected estimates of future activity are necessary. Work patterns, traffic flow, transportation routes, communication channels, patient attendances, minima and maxima of staffing and occupancy, must be determined and correlated and costs must be analysed. Flow charts, network analysis[35] and programme evaluation and review techniques (PERT)[36] are invaluable tools in determining need and in planning and designing buildings.[37] Queuing theory has been effective in determining the number of theatre suites or labour wards required, based on the frequency of demand.[38] Computerised simulation modelling has been used to select the most satisfactory design specifications for a surgical suite[39] and many other applications are certainly possible.

Some of these methods are simple to learn and apply--others require considerable expertise and are time-consuming and expensive. The people with the skills and the training are scarce in the Republic--particularly in the public sector. The cost of the new buildings for Teaching Hospital and the upgrading of the old buildings will, it is estimated, be in excess of R40-million. It would seem worthwhile in these circumstances, particularly in view of the restrictions that SAHNORMS impose on cost and size of the new hospital, to import experts with the necessary skills and experience from overseas, to act as planning consultants and advisers and to train local personnel. The costs of this exercise should not exceed 0,5% of the anticipated total building expenditure, whereas present ad hoc planning methods could result in much greater unnecessary expenditure.

Financing of Hospital Building Projects

The financial sources upon which The Groote Schuur Hospital Group is dependent are described in detail in Chapter 2. The Provincial Administration funds most building projects, via the Department of Works from Capital and Revenue Votes. In the case of major rebuilding or new building for an Academic Hospital, however, the Treasury may make a special allocation of funds. The availability of funds for building projects is never assured and long-term planning is subject to a great deal of uncertainty. It is appreciated that

the holders of the public purse strings are affected, at times, by greater uncertainty on a larger scale and that external factors over which the Government and Provincial Administration have no control, make long-term financing of high-priced projects a stochastic process. Health Service Administrators, however, deal with needs that cannot wait and delays in funding lead to expensive temporary measures and high operating costs. Cost effective analysis and planning, programming and budgeting for long, medium and short term projects is essential in order to ensure that available funds are used economically and effectively. More flexible 'rolling' budgets and better liaison between central Departments and their dependent organisations would reduce unnecessary expenditure of time, effort and money.

EQUIPMENT AND SUPPLIES

The general principles enunciated in regard to manpower and building, apply equally to equipment and supplies. Complexity, sophistication and expense have increased phenomenally in the last two decades with demands, needs and expectations rising in parallel. Rational decision-making in regard to purchasing, dependent on ever greater volumes of information, is essential to ensure that maximum benefit is obtained from scarce resources. In addition, management must see that effective control measures are instituted regarding maintenance and care of equipment and utilisation of supplies.

EQUIPMENT

Non-consumable supplies accounted for 6,4% of the total expenditure for the Groote Schuur Hospital Group in 1976. (Figure 5.4)[40]

Non-consumable supplies	R 2 601 066	6,4% of total
Consumable supplies	R11 995 760	29,5% of total
Total expenditure	R40 566 856	

FIGURE 5.4 Groote Schuur Hospital Group : Expenditure on Consumable and Non-consumable Supplies (1976/1977)

Budgeting

The preparation of estimates and budgeting methods at Groote Schuur Hospital have been discussed in Chapter 2. Departmental Heads are responsible for assessing their requirement for new equipment for the next financial year and submit these to the Supplies Section for costing and thence to the

Finance Section for inclusion in the total Budget. Replacements for equipment which is lost, stolen or no longer repairable are obtained by condemning procedures. Where possible replacements are planned and included in the budget with provision made for unanticipated 'Emergency' condemning. Estimating actual expenditure in each financial year is complicated by variable lead times for obtaining equipment and the 'cut off' of unspent funds at the end of the financial year.

A recent report from the Department of Health and Social Secruity in the United Kingdom comments on the inefficiency of rushed end-of-year spending (brought about by unspent funds)--a common result of 'cut off' annual budgeting procedures. The report states that this practice--

> ... should be eliminated with greater financial flexibility and when proper planning gets underway on the basis of reasonably assured forward resource assumptions. The right way to plan equipment purchasing is on a 3-year rolling budget (1st year firm, 2nd year provisional, 3rd year planned, with annual revision).[41]

Assessment of need and determination of priorities

Cost-effectiveness analysis is a useful tool for determining resource allocation and setting priorities. At the present time the technique is not readily available to Groote Schuur Hospital's administrators, nor is the cost of full-scale cost-effectiveness analysis justified in dealing with any but the most expensive items. Groote Schuur Hospital can nonetheless apply the principles of rational decision-making in a simple but fairly effective manner.

Requests for equipment should be considered in cost categories. Highly paid administrators should not spend valuable time investigating requests for one-time expenditure on items costing less than R100, or annual costs which do not exceed a predetermined amount for every item in constant use in the hospital.[42]

More expensive equipment must be assessed in terms of benefit to the Community, benefits to the patient, to staff, to the institution as a whole, costs of purchase, operating and maintenance costs and availability. The criteria in each category must be defined and weighted to provide a comparative basis for according priorities to each item departmentally and for the hospital as a whole.

Equipment needs should also be considered in terms of programmes within the hospital. This is not the customary approach at Groote Schuur Hospital

where requirements are considered departmentally or for single units, wards etc. The change does not, however, require a major conceptual reorientation as many programmes e.g. coronary care, dialysis and renal transplant, leukaemia therapy and psychiatric care--fall under the aegis of individual departments and could be considered as ongoing integrated activities i.e. programmes.

Gaming Techniques such as Delphi could be used for determining programme and/or equipment priorities. The Equipment Advisory Committee, a multi-disciplinary group representing various departments would be asked to rank (anonymously) the more expensive items of equipment requested for the following financial year by all departments--in order of priority. The responses would then be analysed, gross divergence pinpointed, assessed and the analyses returned to the members of the group for reconsideration and re-ranking. This process can be continued until consensus or near consensus is reached.

> Gaming is appropriate when the experts represent different disciplines or interests ..... Delphi is an iterative procedure for eliciting and refining the opinions of a group of people by means of a series of questionnaires ...[43]

This process is preferable to committee decision-making for several reasons, particularly avoidance of face-to-face confrontation and interpersonal antagonism or favour-seeking. Anonymity reduces the influence of the more persuasive or powerful group members and individual departmental needs can be weighed against total institutional needs with less bias.

Selection of Equipment

Many factors affect the selection of equipment--suitability for a specific purpose, availability, delivery time, back-up service, guarantees, and the presence of appropriately trained staff or the need to train staff. The writing of equipment specifications requires depth of knowledge and experience of a wide variety of technology. Particular attention should be paid at the present time to the possibility of procuring locally manufactured goods rather than imported products, in view of the uncertainty regarding supply from some overseas countries and of continuing availability of spares and expertise.

Choice of equipment may also be restricted by a policy of standardisation for hospital equipment. If standardisation is to succeed there must be critical evaluation of all the items available by skilled teams of doctors, nurses and technicians. Criteria must be clear and the methods of evaluation

uniform. The reports must be centralised so that they are readily available for all potential buyers to study and they must be frequently updated. The report on buying for the National Health Service (NHS) recommends that a 'limited list' system be developed following evaluation. This would be less restrictive than recommending one product only and would encourage competition while reducing the unnecessarily large variety with which the bewildered purchaser is faced at present.[44] Standardisation also ensures more economical and efficient maintenance and follow-up service if it results in the installation of several similar items in a region. Further benefits of standardisation would be cheaper maintenance, exchangeability and easier training of personnel. Standardisation should not be imposed but should, if at all possible, be achieved by negotiation and agreement between users.[45]

Apart from centralisation at a Hospitals Department or even State Health level of evaluation reports, each hospital should collect and collate relevant information on equipment in use and relate it to forthcoming purchases, so that the most satisfactory equipment can be recommended for purchase.[46]

Purchasing Policy

The requirements for standardisation may conflict with the public sector regulations regarding purchase by tender. Groote Schuur Hospital is bound by these regulations, which require that tenders (formal or informal) be called, for all items costing more than a specified amount.[47] Exceptions are made in certain cases if approval is granted by the Executive Committee of the Provincial Administration. Standardisation is not always accepted as a motivation for accepting a tender if there are cheaper offers. It is important, therefore, that the Department of Hospital Services investigate standardisation, the active implementation of a formal evaluation process and a Central Equipment Information Service.

Centralised or Bulk-Purchasing--Tendering and contracting are undertaken at several levels in the public sector

1. The State Tender Board awards contracts for a wide range of consumable and non-consumable goods. Subsidiary departments and institutions (including Provincial Hospitals) are bound by these contracts.

2. The Provincial Administration also awards contracts (following formal tenders) for a variety of goods not included in the State Tender Board contracts.

3. Individual Provincial hospitals may also arrange contracts for goods which are not covered by State or Provincial contracts.

State and Provincial contracts offer, in theory, many advantages of centralised, bulk-purchasing--reduced costs, reduction of labour in individual institutions, standardisation, greater control over procedures vis-a-vis quality and delivery, and better opportunities for product research and evaluation. The disadvantages are that contact between supplier and user is indirect and the latter has no control over the former. Complaints about quality and service follow a roundabout route and are less effective in achieving improvements.

In the Republic, State Tenders are awarded on a country-wide basis and suppliers of many items are remote from a large number of users, with the result that transport costs nullify the economies of bulk-purchasing. Contracts change annually or biannually and suppliers are caught between investing in larger plant to fulfil large State contracts and possibly being over-capitalised if they lose the contract in subsequent years.

Serious consideration should be given to regionalising state contracts or delegating contracting rights for some items to the Provincial authorities. Local producers should be selected wherever possible to avoid incurring transportation costs and to distribute contracts on a more equitable basis. It is believed that Provincial contracts would achieve the benefits of nation-wide purchasing without suffering the disadvantages.[48] For items which are specific to hospitals where considerable technical and professional expertise is required, Hospital Department contracts should be arranged to supply all Provincial Hospitals--using local suppliers where possible, as is already done in some instances.

There are disadvantages in centralising the purchasing of hospital equipment where individual preference plays a significant role. If standardisation can be achieved, however, by negotiation and agreement--group purchasing at this level would effect considerable savings and encourage rational selection of equipment and other supplies. Individual hospitals should only arrange contracts if there are no other potential purchasers amongst other Provincial hospitals. This procedure could be satisfactorily linked to the 'limited list' system to enable individual institutions to retain some discretionary freedom of choice.

There are many other aspects of equipment purchasing and control that are important--such as safety, in-house maintenance ability versus outside maintenance contracts, responsibility for safe-keeping of equipment and the need for research and development. Space does not, however, permit discussion on these and other important matters relating to non-consumable supplies.

CONSUMABLE SUPPLIES

Consumables accounted for 29,5% of the Groote Schuur Hospital Group budget in 1976/1977 (Figure 5.3). This is considerably higher than expenditure on non-consumable goods (6,4%) and all the preceding comments on assessment, selection and purchasing policy and practice are, therefore, of even greater significance than in relation to equipment. Consumable supplies require considerable organisation from time of purchase, involving a large number of people, space and control. It is estimated that if the time spent by personnel on supply activities--including storage and distribution costs were calculated, at least one-third of a hospital's operating expenses would relate to consumable supplies.[49]

Storage

Regional and central stores are essential for control of consumables and for effective distribution. The Cape Provincial Administration maintains a Regional Stores complex, which holds non-perishable goods of various kinds for supply to hospitals and other institutions. Regional stores provide a holding area for items for which institutions do not have sufficient space--particularly smaller hospitals and schools.

Most hospitals, however, require central stores on site for other goods which are delivered direct from suppliers, or for which they have arranged hospital contracts--particularly foodstuffs, pharmaceuticals, surgical sundries, X-ray film and disposables. It is necessary for the central hospital store or stores to hold as much stock as possible, in order to reduce storage space in wards and departments and to eliminate stock-piling in peripheral stores which is costly and frequently poorly controlled.[50]

Central Sterile Supply Depots (CSSD) have revolutionised sterilisation and storage of sterile articles in hospitals in the last decade. Optimally the CSSD should be adjacent to the central store for easier management and distribution of all goods and to ensure a 24-hour service.[51] Spare equipment should also be stored nearby to avoid duplication, redundancy and unnecessary ward storage. These services must function round-the-clock and must ensure

constant availability of sterile packs, emergency supplies and equipment. These services are unfortunately spread throughout Groote Schuur Hospital at present and it is essential that they be relocated in a single area when the new hospital is designed.

Inventory Control

Effective inventory and stock control serves several purposes. It ensures availability and smooth and orderly flow of supplies; provides information on losses and breakages so that excess depredations can be pinpointed and dealt with; reduces losses from theft and should also provide costing and accounting data.[52] There are several manual systems of control in general use--the two-bin system, the travelling requisition, and the cardex systems--all of which are used for different purposes at Groote Schuur Hospital. A computerised stores system has been designed for implementation at Cape Provincial Hospitals in the future. It is anticipated that this system will provide valuable information, not available at present, on supplies of goods to individual units and departments facilitating analysis of unit costs for various procedures, wards and departments and enabling hospital management to trace excessive and wasteful expenditure--as well as economical and careful consumption. This information related to other measures of effectiveness will be an exciting new management tool and will facilitate better control of all consumables. ABC analysis as proposed by Ammer is made possible by computerisation. This is a way of apportioning a manager's time according to the value of the goods he is controlling--

> The material's manager utilising ABC analysis devotes most of the purchasing and inventory management time, to the high-value or 'A' items and to a large extent lets the low value 'C' items take care of themselves. [53]

This seems a logical approach to material control if 'value' is judged by annual expenditure and not unit price, and would help to achieve effective and economical use of supplies and manpower.

Computerised systems are more accurate, more comprehensive and more informative--they are also more expensive than manual methods. If, however, the extra benefits are as great as is anticipated then the cost-savings will justify computerisation.

Distribution

The SAHNORMS report recommended as follows--

> caution is advised in the application of mechanised and automated conveyor systems, and these should only be considered where their cost advantages could be unequivocally demonstrated by means of a life cycle cost analysis [54]

It is felt that such an analysis would be justified--using the system at the new Johannesburg General Hospital as a model.[55]

In the interim, non-mechanised distribution systems can be considered; ranging from the inefficiency of 'fetch-and-carry' to the more modern concept of topping-up, imprest or 'par'-level supply systems. In the latter method--quotas for each supply item are established and this quota is maintained by regular supply-trolley rounds. This system eliminates requisitions and saves ward-staff time but, due to the uneven consumption from day to day, replenishment may require several messenger trips after a busy period--which is uneconomical, time-consuming and delays deliveries to other units. Many different trolleys have to do the rounds, to satisfy all ward requirements--provisions, vacolitres, sterile packs, linen, hardware, stationery, surgical supplies and so on, and ward storage areas have to be maintained at the customary level to provide sufficient space for all times.

An interesting extension of this 'par'-level approach--the exchange cart--is receiving considerable attention and has been widely reported in the literature.[56] This system works best if the carts contain all items used by a ward or department from 'paper clips to intravenous solutions'.[57]

Quotas are established for all requirements which may number as many as 200 items and a full cart is delivered to the ward each day in exchange for the used one, which is then taken back to the central store for replenishing. Different carts can be used for linen, CSSD packs and provisions. The carts replace all conventional storage units in wards and are kept clean and in working order by the central store. This idea is worth further investigation for possible use at Groote Schoor Hospital as it has obvious economic advantages for inventory control, reduction of stock-holding by wards and reduction of nursing staff involvement in supplies activities.

COST CONTROL

Consumables are a major item of expenditure in the hospital budget, utilisation of which is extremely difficult to control. Avoidance of waste and prevention of theft depend largely on the personal sense of responsibility,

motivation and honesty of all employees. Security measures to prevent theft are unhappily an integral part of hospital management, for which a Security Department is responsible to Groote Schuur Hospital.

The Cost Control committee at Groote Schuur Hospital is responsible for standardisation and for ensuring effective control and economical consumption of consumable supplies.[58] The Pharmaceutical Advisory Committee is responsible for review, standardisation and control of all medicines. Various other committees (Equipment, Printing, Technical Advisory and Theatre) work in conjunction with the Cost Control Committee to constantly review utilisation, procedures, contracts and costs of a wide range of products.

The Cost Control Committee is hampered in its activities by the non-availability of departmental resource-consumption data and it is hoped that computerised inventory control will help in this regard. Despite this lack, the committee has effected significant savings in various services--notably cleaning and surgical supplies by standardisation and determination of quotas. The work of this committee is of value and should be extended by involving a greater number of employees in work groups and teams to study specific problems. The aims of the committee should be broadened to encompass other aspects of expenditure including staffing, patient scheduling, investigations and procedures and medical care policies. The Cost Control Committee should also be an important source of information for the Planning Committee as well as having executive powers of its own.

Controlling costs in hospitals is essential but will not have an appreciable effect on overall health service expenditure if the manufacturers and suppliers of medical equipment, goods and pharmaceuticals are not also subject to some control. These industries have been discussed in Chapter 1.

SUMMARY

Hospitals' requirements for space and facilities have expanded considerably in the last decade. Increasing specialisation, technological and scientific advances, growing populations with rising expectations of health care availability, changing disease patterns and new health philosophies and policies have created different needs.

Spiralling building costs which have been exceeded by rapidly rising operating costs have imposed limitations on new hospital buildings. These limitations should be viewed as a challenge to more thorough and careful analysis of needs and the development of a more effective Hospital Planning

Committee. Planning procedures and design considerations are discussed with particular reference to the need for flexibility and awareness of the clients' requirements for safe, economical operation.

The use of sophisticated quantitative techniques such as Operations Research is recommended for determining needs and for preliminary design modelling. It is suggested that it may be necessary to import these skills but that anticipated savings in building costs would compensate for this additional expense.

Financing of hospital building projects is reviewed and the difficulties associated with forward planning in the absence of assured financial support is emphasised. Cost effectiveness analysis and selected planning, programming, budgeting procedures could be effectively used for hospital planning--particularly if the Treasury revised its fiscal policy and introduced a system of 'rolling' budgets.

These problems and principles can be applied with equal force to the acquisition of equipment and supplies which together accounted for 35,9% of the Group's budget in 1976/1977. The difficulties associated with annual budgets in view of uncertain lead-times for delivery of equipment are defined--once again with reference to the need for 'rolling' budgets. Proposals are made for the use of various techniques such as cost-effectiveness analysis, programme-budgeting and gaming, for assessing equipment requests and determining priorities--and the establishment of a Central Equipment Information Service--at Hospital Department level--to evaluate, co-ordinate and standardise equipment purchases is recommended. Bulk-purchasing is discussed briefly and a suggestion made that regionalisation of suppliers would be as effective as nation-wide contracts, in achieving economies of scale, but would be more economical (by eliminating transport costs) and would improve communications and service between suppliers and user organisations.

The procedures and costs involved in handling consumable supplies are outlined, particularly storage, inventory control and distribution and it is suggested that all stores should be adjacent to one another, computerised inventory control would provide many benefits including departmental or programme costing, mechanised distribution systems should be investigated as proposed in SAHNORMS and an exchange cart system should be examined for possible implementation at Groote Schuur Hospital.

Finally the functions of the Cost Control Committee are considered and an extension of their activities beyond control of the utilisation of consumables is suggested. The reduction of expenditure on all aspects of hospital activity, without impairing the quality of care, is a major administrative objective.

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6. THROUGHPUT OR THE PROCESS OF CONVERSION

The systems approach to organisations requires that the system and its boundaries should be defined, its environment and external influences determined and its inputs analysed. Thereafter, the process of converting the inputs into the product must be examined. This calls for analysis of the goals and values of the system, of the tasks to be performed including the tools, equipment and facilities used and of the people who perform the tasks. The relationships between the people and their attitudes, aspirations, sentiments, and beliefs are critical to the performance of their tasks, as is the organisational structure which enables the people and their tools to function. Finally the managerial subsystem which directs and controls the whole organisation including the decision-making and information processes must be studied.

THE SOCIOTECHNICAL SYSTEM

This concept has been depicted diagrammatically by Kast and Rosenzweig (see Figure 6.1), which is a simple representation of the subsystems involved in the process of conversion.[1] This outlines the structured Sociotechnical system described by Emery, Trist and others of the Tavistock Institute,[2] which will be used as a basis for discussion of the conversion of input to output at Teaching Hospital.

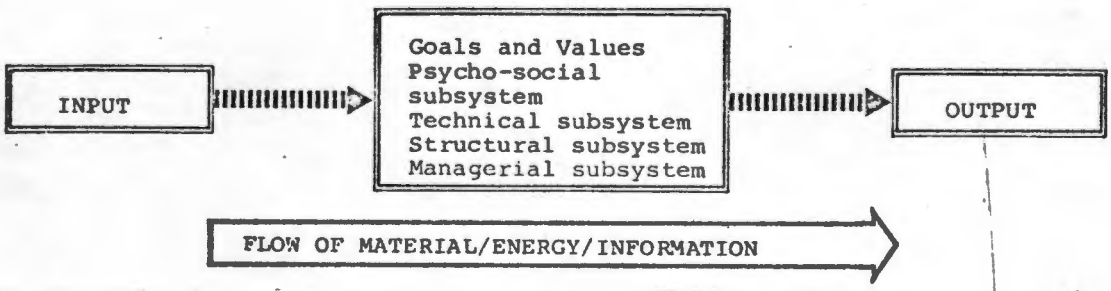

FIGURE 6.1 The Sociotechnical System

SOURCE: Kast and Rosenzweig, Organisation and Management, p.121.

GOALS AND VALUES

The goals and values of any organisation form the basis for the structure of the organisation, for the planning process, for setting standards and priorities and for evaluating performance. They are also forceful integrative factors, uniting the aims of all participants and inducing individuals to work towards organisational rather than personal goals.

Values can be defined as implicit, accepted beliefs, held by individuals as to what is good and desirable. Values provide a basis for choosing between alternative courses of action. Extended to a whole society--they form a system of communal attitudes which serve as norms for human behaviour.

Goals are the expression of the desired end-results which individuals or organisations wish to achieve and include objectives, aims, targets and so on in a hierarchy of goals, sub-goals, objectives, and sub-objectives for all departments and levels. Goals give an organisation legitimacy and entitle it to receive resource inputs from the environment. The set of goals for any organisation can be considered in three categories

1. Social (environmental) goals.
2. System (organisational) goals.
3. Participant (individual) goals.[3]

Considering these with reference to the hospital, it is apparent that each of these categories comprises many individuals--each with different and possibly conflicting goals influenced by their personal values. Stated goals may differ from actual operational objectives which lack clear definition, but are nonetheless inherent in hospital policy and the routine activities of the organisation. Goals may therefore be ambiguous and intangible. There will be conflict and differences between departmental, individual and organisational goals tending inevitably to a multiplicity of desired ends and the need for bargaining and adjustment in order to resolve conflicts.

Social Environmental Goals

The Groote Schuur Hospital Group is dependent upon its environment for resource inputs and is limited in its activities by the designated purpose for which it was instituted and is financed. This purpose is the treatment of sick people of all ages, races and sexes, suffering from any acute or chronic, physical or mental illness either on an ambulatory or short-term

inpatient basis. It is both a referral centre and a community health service. It does not provide long-term, convalescent or rehabilitative inpatient care nor is it responsible for treatment of psychotic mental illnesses.

In addition to these patient care and community service functions, Groote Schuur is an academic hospital, affiliated to a large medical school which trains under- and post-graduate medical, paramedical and nursing students as well as other supplementary health service professionals and scientists.

In addition to its patient care, community service and teaching functions the Groote Schuur Hospital Group and the Medical School have many research commitments. Apart from these designated goals the hospital is also bound by broader social system goals in terms of universal values such as social concern, personal responsibility for ones own welfare, freedom of choice and equality of access to health services.[4]

> The organisation can survive only by meeting certain goals imposed by the society which legitimises its activities. It is an instrument used in the accomplishment of society's goals. [5]

Organisational System Goals

The organisation has discretion, within the constraints imposed by environmental forces, to determine its own goals and the means whereby these are achieved. Gross has classified organisational goals in a global matrix[6]

1. Satisfaction of interests--both internal and external. These include needs and desires of all participants and may be difficult to identify but relate to concepts of welfare, utility and benefit.

2. Output of services or products--and maintenance of effectivensss and quality. Output also relates to enhancement of the 'image' of the organisation.

3. Efficiency in the conversion of inputs to outputs--including containment of costs.

4. Investing in the organisation's viability. This entails growth as well as survival and requires that inputs be used for other purposes--investment in human, physical and organisational assets--and not purely for the production of outputs.

5. Acquiring resources--which means competition with other organisations and other community needs.

6. Observance of codes--including general law, formal and informal rules of the organisation, and the prescribed ethical codes of professional employees.

7. Rationality--technical rationality is concerned with the use of the best available technical and scientific methods and equipment. Administrative rationality is the use of the best methods of management.

Individual Participant Goals

There are two groups of individual participants in the hospital environment--clients and providers--

The Client's goals include-

1. Easy access to hospital services.
2. High quality care.
3. Maintenance of autonomy and dignity.
4. Provider concern and responsiveness to the client's needs and convenience.
5. Satisfactory outcome of contact with the hospital service.

The providers' needs are ostensibly to serve their clients and in theory, therefore, clients' and providers' goals should be identical. Ideally this is so but health professionals, particularly doctors have additional goals which include--

1. Clinical freedom.
2. Maintenance of professional skill and knowledge and time for continuing education and research.
3. Fair compensation and other rewards.
4. Control over conditions of practice.
5. Maintenance of professional standards and ethical codes.[7]

In addition there are all the other human needs for recognition, status, power, self-fulfilment and actualisation which motivate all the individual participants in the hospital.

Goal Congruence

Goals are broad, frequently ideological statements which are intangible and unquantifiable. The influence or power exercised by the various

participating groups changes over time, which causes changes in goals--both stated and unstated. The organisation seeks to satisfy the goals of all participants in order to ensure their continued participation in the activities of the enterprise.

Hospitals are fortunate in employing personnel (particularly health professionals) whose goals and values are significantly congruent with those of the organisation and for whom the psychic satisfaction derived from their work is high.[8]

Reciprocation and internalisation of goals takes place to a marked degree and participants needs can be satisfied in many respects. For doctors and scientists, this goal congruence is an important factor but their traditional independence of action is threatened by the inevitable bureaucratisation which occurs when professionals are full-time employees of an organisation. The medical staffs' goals which are internalised with those of the profession, rather than with those of the organisation, may lead to conflict regarding the means used for goal accomplishment rather than with the goals themselves.[9]

Setting Objectives

Top management in hospitals--the strategic or institutional level--relates the activities of the organisation to the environment and is concerned with setting broad, ideological goals with substantial flexibility. These need to be transformed into measurable objectives for the operational level of the hospital with definition of the means whereby these goals are to be accomplished. There is a hierarchy of objectives in any organisation whereby the goal achievement at each level provides the means for achievement at the next higher level. Both objectives and means should be determined by management, in consultation with the operators at each level, to enhance integration of participant and organisational goals--so called Management by Objectives, originally propounded by Drucker.[10]

There are dangers inherent in the process of specifying goals. Donabedian states that the intangibility of goals is valuable, allowing for flexibility and suppression of conflict.[11] Quantification and measurement of goal accomplishment may also lead to overemphasis of those activities which can be measured, to the detriment of abstract ideals.

> Most organisations under pressure to be rational are eager to measure their efficiency. Curiously the very effort--the desire to establish how we are doing and to find ways of improving if we are not doing as well as we ought to do, often has quite undesired effects from the

> point of view of the organisational goals. Frequent measuring can distort the organisational efforts because as a rule, some aspects of its output are more measurable than the others. Frequent measuring tends to encourage over-production of highly measurable items and neglect of the less measurable ones.[12]

In hospitals, where traditionally hours worked and services rendered were given without thought to the providers' own physical welfare or personal gain, emphasis on measurement has inevitably contributed to a diminution of the concept of selfless dedication.

Finally, in setting objectives, management must be wary of the very real dangers of goal displacement, whereby ends become more important than means. Goal displacement is inherent in bureaucracies. In large complex organisations such as the Groote Schuur Hospital Group the delegation of authority and responsibility through many levels may result in the goals themselves becoming obscured and the procedures designed for goal accomplishment becoming the terminal value rather than the instrument.

Groote Schuur Hospital Group's Goals

The management of Groote Schuur Hospital has never formally defined hospital goals, other than in broad terms as described under the section on environmental goals. The objectives of the hospital do need, however, to be more precisely defined for the operating level participants. It is necessary to ascertain quite clearly what the hospital is trying to achieve and whether the declared objectives are accepted by the operational staff or whether they are pursuing other objectives which are in conflict with those of the organisation.

Groote Schuur Hospital has no single purpose but an undefined set of multiple objectives, many of which are in opposition to one another. Conflict may be avoided by not defining the hospital's goals too clearly but lack of definition also causes stress, tension and confusion. A choice must be made between competing goals in order to clarify the hospital's function. The following examples indicate some of the problems.

Are the hospital's goals--

1. To provide specialised care in a referral centre--or--
   To increase the availability of services to meet all the unmet health needs of the community.

2. To undertake an active programme of community health education and encourage the development of domiciliary care, community health centres and self-help schemes--or--
To expand the hospital's own ambulatory services to provide sufficient 'teaching material' for students in-house.

3. To contain costs by limiting admissions, reducing outpatient attendances, decreasing the length of stay, and controlling investigations and prescriptions--or--
To obtain as large a share of the available resources as possible because an academic hospital must keep pace with all new developments regardless of costs.

4. To train an unlimited number of specialist medical and other health care professionals--or--
To ascertain and satisfy the needs of the community for generalists in the health field.

5. To undertake intensive, esoteric research and therapeutic programmes requiring sophisticated technology and skills, as available in the most highly developed industrial societies -- or--
To investigate and develop diagnostic and treatment programmes which are of particular relevance to the South African situation.

6. To institute programmes for self-regulation, such as peer-review and medical audit with a view to improving and controlling medical services --or--
To defend the medical profession's absolute right to clinical freedom and autonomy.

7. To develop quality control programmes for all aspects of the hospital's function--or--
To provide simple but accurate measures of utilisation alone.

8. To save money by restricting privileges to which hospital staff are accustomed--or--
To improve working conditions and morale of employees in every way possible, in the belief that alienation of employees is detrimental to the accomplishment of all objectives.

9. To attain all of these--and others--in some unidentified proportion?

Scarcity of all resources and increasing emphasis on preventive health services, emphasise the need for Groote Schuur Hospital to clarify its goals and objectives. These decisions cannot be made by hospital management alone but require consultation with all the participants, both environmental and internal.

PSYCHO-SOCIAL AND TECHNICAL SUBSYSTEMS

Certain aspects of the psycho-social system, which is concerned with inter-personal relationships, values, perceptions and needs of the participants in the organisation, have been discussed in previous sections and some features of the technical subsystem were dealt with in Chapter 5.

The study of the interaction between these two subsystems is beyond the scope of this work. Hospital administrators must recognise, however, that technology makes heavy demands on the human resources of the organisation and methods of enabling the man/machine relationship to function effectively must be consciously sought. The introduction of new technology may be very stressful. It is management's responsibility to ensure that the psycho-social and technical subsystems are harmoniously integrated, by selection of the most satisfactory work methods, to achieve maximum productivity.[13] In the hospital environment this applies particularly to computerised information systems.

The rest of this Chapter will therefore be mainly concerned with the structure of the organisation and selected aspects of the managerial subsystem, as space does not permit more detailed examination of other features of the socio-technical system.

STRUCTURE OF THE ORGANISATION--FORMAL AND INFORMAL RELATIONSHIPS

The technological and psycho-social subsystems function within the framework of and linked by, the structure of the organisation, which deals with the allocation of tasks to working units and the integrating of technical and managerial skills by a pattern of co-ordinating relationships. Positions and duties are ordered in a formal design which has been defined by Kast and Rosenzweig.

> In the formal sense, structure is set forth by the organisation chart, by positions and job descriptions, and by rules and procedures. It also concerns the pattern of authority, communications and work flow. In a sense, the organisation structure provides for formalisation of relationships between the technical and psycho-social subsystems.[14]

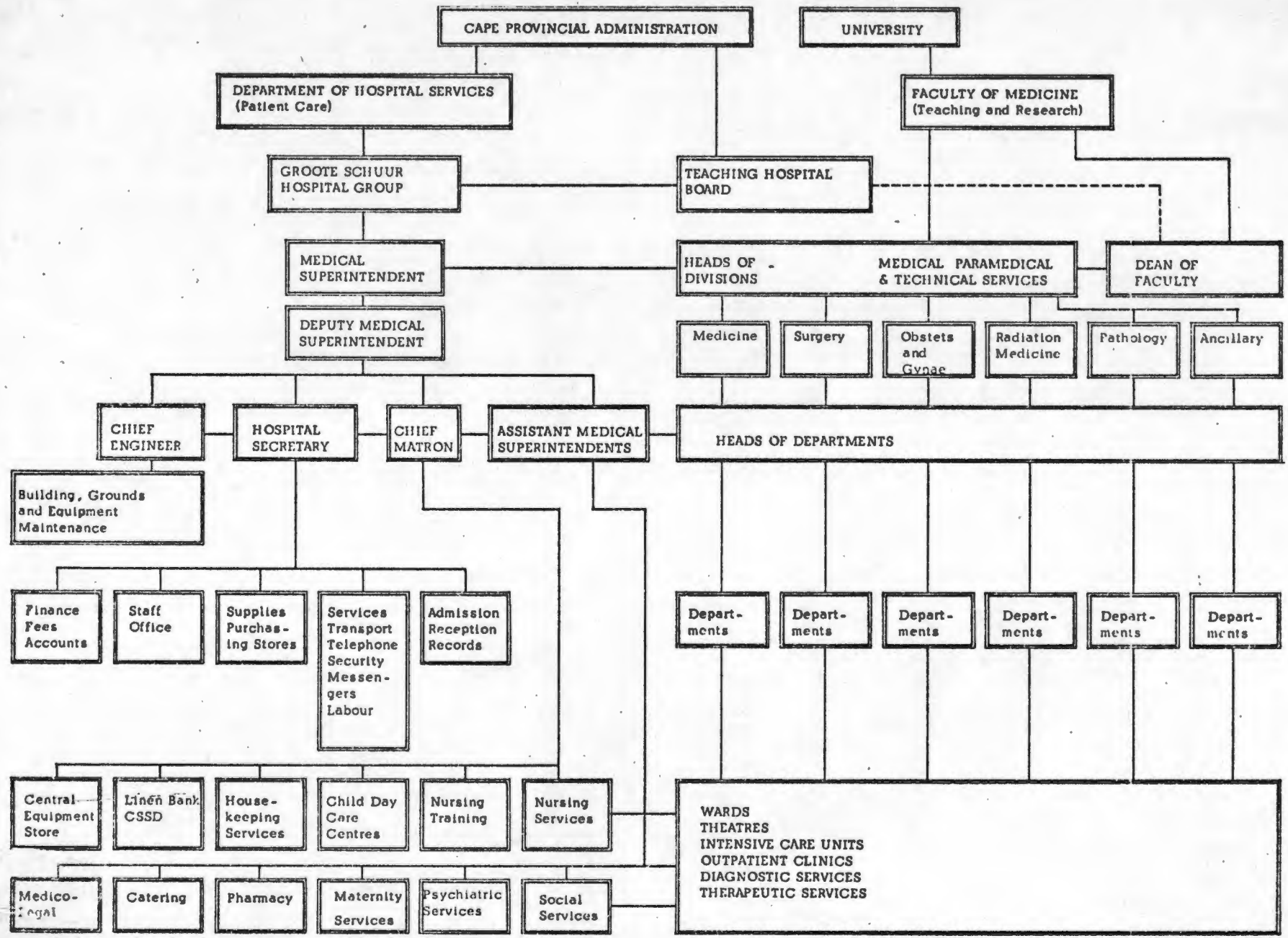

FIGURE 6.2 Groote Schuur Hospital Group: The Organisation Chart

This formal design defines a chain of command and enables administrators to integrate specialised functions.

There are many other interactions in organisations which take place outside, along-side and within the formal structure which have been called 'the non-rational dimensions of organisational behaviour'.[15] These unofficial and spontaneous activities which arise to fill the gaps in formal regulations and channels of communications, constitute the informal organisation, which is essential for the development and survival of the formal structure.

Many aspects of the informal system may become institutionalised and incorporated into the formal structure, particularly if the effects of spontaneous grouping and co-operative efforts are beneficial to the organisation. At times, these informal groups may have aims which are at variance with organisational goals and in such circumstances the groups' activities will be harmful to the organisation and must be controlled or eliminated.

The formal and informal organisations are so interdependent and closely linked that they will be viewed as co-operative systems--a totality or relationships functioning within the framework of the formal structure.

The Organisation Chart - Groote Schuur Hospital Group

The formal chart (Figure 6.2) cannot be comprehensive or entirely accurate in depicting an organisation as complex as Teaching Hospital. It is an approximation of scalar relationships and positions rather than a precise representation.

The hospital is an hierarchical organisation. The Medical Superintendent is formally given the total responsibility and authority for the control and supervision of the administrative and patient care functions of the hospital and as Chief Executive is placed at the head of an hierarchical pyramid, with the Matron and Secretary (lay administrator) in subordinate roles. This is the traditional hospital management triangle described by many writers.[16] The qualifications of the chief executive may vary--but this is not at issue here.

The hierarchical pyramid is repeated in each department--medical staff, nursing, technical and general administration.

See diagram

The Medical Hierarchy-- This hierarchy applies to the administrative activities of the medical staff i.e. the organisation of patient care, teaching and research rather than to the clinical functions of doctors. Rowbottom et al reported from their research that clinical autonomy is virtually absolute. Doctors are accountable to their patients, themselves, their colleagues and their profession for their clinical actions but not to any hierarchical authority. The constraints on their actions are those arising from professional ethics and norms, the law, and the terms of their employment regarding allocation of duties, hours to be worked etc. In all other respects the doctor works in a collegial manner with his peers and is not accountable to the administration for his clinical actions.[17] This point has previously been made in regard to the relationship of the Medical Superintendent to the clinical staff at Groote Schuur. The Junior medical staff--interns and registrars are exceptions to this statement and are clearly subordinate to the consultants, while in a learning role.

The Medical Superintendent is neither super-nor-subordinate to the Divisional heads and the Dean of the Medical Faculty, but relates to them in a collegial fashion--formally via the Teaching Hospital Central Advisory Committee and the Medical Faculty Board, and informally in diverse ways.

The collegium has been defined by Rowbottom et al--

> This is a role-structure in which a number of people attempt to co-operate freely, without any of them having authority over the others .... Action on significant issues can only proceed with the agreement of all, where the interests of all are involved. Meetings of members of the coalition thus have inevitably, a certain underlying element of negotiation.[18]

The dual authority/dual control nature of the structure of the organisation of the Groote Schuur Hospital Group, and the unique relationship between the formal authority of position as represented by the administrative hierarchy, and the authority of knowledge represented by the medical staff and other professionals is clearly shown in Figure 6.2. The Medical Superintendent possesses, in theory, both kinds of authority thereby justifying his position.

Figure 6.2 also shows clearly the anomalous situation of the assistant medical superintendents, who have few formal relationships in the vertical structure, as responsibility for virtually all major functions is allocated or delegated to other positions.

(Note: For simplicity, the designation Assistant Medical Superintendent is used to describe all Senior and Assistant Medical Superintendents.) The Assistant Medical Superintendents are responsible for some ancillary functions--catering, pharmacy, social and voluntary services, as well as supervision of other hospitals in the Group, and chairmanship of various committees but their real function, which is to synthesise the components of hospital activity, is not indicated in the formal chart. They do not have a clearly distinguishable function in a traditional scalar hierarchy.

The major responsibility borne by nursing personnel for both patient care and administrative services is indicated in the chart which demonstrates, that although the medical and nursing staff work closely together at the operating level, there is no direct communication between Divisional and Departmental medical heads and senior nursing and lay administrators. This lack of horizontal communication indicated in the formal chart, is generally reflected in practice although there are a few attempts at informal bridging.

Policies, Rules and Regulations

The rules and regulations controlling the Groote Schuur Group emanate from several external sources--State, Provincial Administration, Hospitals Department, University and various controlling bodies and organisations as described in previous chapters.

> Internal Hospital Policies and Procedures comprise a multiplicity of documents and regulations, setting out guidelines or instructions for employees in the hospital; job descriptions and requirements; manuals of procedures for nursing and technical staff; instructions for houseman and registrars; disaster procedure manual and frequent ad hoc reminders, requests and instructions--which are issued from time to time by hospital management and by departmental heads.

These formal prescriptions control most of the administrative activity at Groote Schuur Hospital and the working behaviour and attitudes of the professional, nursing, technical and paraprofessional staff. Procedural rules and regulations are intrinsic to the administration of organisations both for co-ordination and for control. Promulgation of more and more rules leads, however, to increasing centralisation.[19] Great care should therefore be exercised in the formulation of rules and regulations if decentralisation is an objective of management. Other means of co-ordination and control, which will be discussed in the section on the

managerial system, can preferably be used in professional, democratic, polycentric organisations such as Groote Schuur Hospital, rather than rule by edict and decree.

The structure of the organisation together with the controlling and co-ordinating rules, regulations and procedures combine with the maintenance subsystems to integrate the process functions of the hospital.

The Maintenance Subsystems

These subsystems are responsible for the procurement of inputs and the disposal of products and are an integral part of the organisation's structure.[20] They form interfaces at the boundaries of the organisation, between the organisation and its environment, and at Groote Schuur Hospital include those departments concerned with purchasing and supplies, finance and accounts, transport, pharmacy, personnel, public relations, repair and maintenance of buildings and grounds and all the services involved in the reception and discharge of patients. These are the essential support activities of the institution which maintain the technical and psycho-social subsystems.

The formal organisation chart (Figure 6.2) does not reflect many of the interactions and relationships in the hospital and is confusing because the structure is confused. Restructuring the framework within the constraints of the Hospitals Ordinance and the Joint Agreement is possible, however, especially if some of the more significant informal relationships are incorporated into the formal design, using the concept of the matrix organisation.

The Matrix Organisation

Matrix Organisations are those in which the scalar process (vertical co-ordination by means of departmentalisation and the formal chain of command) co-exists simultaneously with lateral/horizontal co-ordination.[21] The pure matrix always has a dual authority structure (i.e. every person involved has two bosses) with a power balance between the two forms of co-ordination. The choice of organisation design can be placed at any point on a continuum between the strictly hierarchical model and the totally unstructured collegial model.[22]

The matrix is a flexible, administrative innovation created to solve specific problems or for specific projects which may be temporary or on-going. Project teams are formed consisting of representatives of the relevant disciplines with emphasis on knowledge rather than rank. Each member in the team is given responsibility and authority and all are expected to work

as a cohesive unit with a project manager who is fully responsible for the entire project--and the team members. There may be many teams (depending on the complexity and differentiation of the organisation) resulting in the matrix structure (see Figure 6.3). High goal congruence between individuals and the organisation is required for this participatory involvement in projects or programmes.[23]

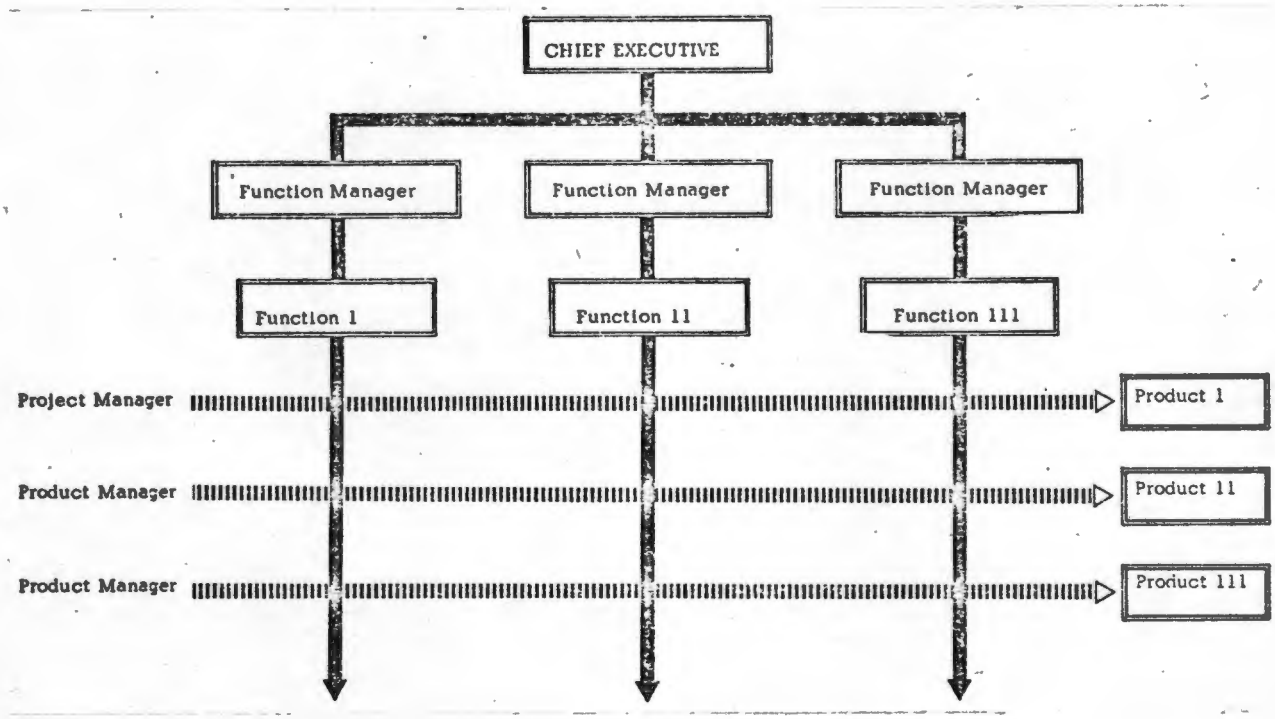

FIGURE 6.3 A Simple Matrix Organisation

Academic hospitals are exceptional in their complexity and diversity--they are multiple input, multitechnology, multiproduct enterprises dependent on creativity and innovation, with high interdependence of services. They can also be described as professional organisations[24] or professional bureaucracies, containing a mixture of technical tasks (both uniform and non-uniform) resulting in duality of authority and control and requiring intricate and elaborate methods of co-ordination.[25] Hospital personnel have high goal congruence with an overriding concern for patient welfare and are strongly motivated to the accomplishment of the hospital's primary goal of patient care. Despite the problems of integrating professionals with the bureaucratic organisation, it is considered that this predominating influence is the single most important factor in unifying and co-ordinating hospital

functions.

The stable, routinised functions of the supportive subsystems in the hospital are best managed in the bureaucratic mode. The differentiated, innovative, highly technical functions of the specialist professional staff demand a loose, collegial, decentralised mode with horizontal, vertical and diagonal interactions. Drucker contends that the hierarchical, structured mode is also essential for efficient functioning of the total organisation but that this must allow for other relationships and flexibility.

> Organisation builders (and even organisation theorists) will have to learn that sound organisation structure needs both (a) an hierarchical structure of authority and (b) a capacity to organise task forces, teams and individuals for work on both a permanent and temporary basis. [26]

With increasing size and complexity there is also a tendency for organisations to increase their professional and clerical staff but not the managerial staff component.[27] The increase in the professional and clerical staff leads to increasing differentiation and development of lateral and diagonal relationships. This proliferation in units and relationships makes co-ordination and control an impossible task for top management.

> ... in the modern hospital a great many horizontal interactions are required. Patient treatment may involve a number of departments and specialised units many of which are highly technical. It would be impossible for any single superior to co-ordinate all the activities required. [28]

The result is decentralisation of decision-making, control and operations--with planning, financial, policy-making and provision of facilities retained as a centralised function. This development of matrices can also be described as polycentric or pluralist management.[29]

In matrix organisations--decision-making is dispersed throughout the organisation. Top management is freed from constant involvement in routine decision-making and responsibility for specific tasks is delegated to project teams or work-groups. The concept arose from the National Aeronautics and Space Administration's (NASA) need to integrate multidisciplinary, multi-institutional personnel to achieve more rapid development in Space technology during the early 60's. The major problems which faced NASA were the need for intensive specialisation and for integration and co-ordination of these diverse specialised units.[30] Project teams and Task forces were found to be the most successful means of achieving this integration, which has since

further evolved into concepts of Programme Management.[31]

> One of the most promising strategies to induce co-operation and integration of effort on crucial problems is the development of project Teams and the matrix organisation.[32]

The hospital's complex activities are traditionally based on teams which are the foundation of patient care in theatres, wards and clinics. Teams may be formed to deal with one project or they may be a stable group working permanently on some aspect of disease, investigation or treatment. The team may be formed for one patient at a time--on call when needed-- or may be a permanent group formed for a specific therapeutic or diagnostic purpose.

These working groups constitute the major part of the informal organisation of the hospital. The teams are not formalised, their duties not specified by regulation, their interactions, responsibility and utilisation of resources not strictly supervised or controlled. Major decisions on resource use are taken by relatively low-ranking individuals, responsible for transforming inputs into outputs and constituting the decentralised, loosely-structured operations level of the organisation, but subject at the same time to hierarchical control within the formal structure of each discipline as previously described.

Accepting that Teaching hospital is already functioning as a matrix but that co-ordination of teams and activities requires more formal definition, an alternative organisation structure is proposed.

A Matrix Organisation for Groote Schuur Hospital Group

Drucker stresses that structures cannot be imposed on organisations but must be built block by block from the objectives, strategies and key tasks of the organisation.[33] The hospital's broad objectives have been defined.

Various strategies must be employed to attain these objectives. Information on external and internal activities must be obtained; needs must be determined; unmet needs identified; ways of meeting needs must be sought; priorities, programmes and budgets must be determined; acquisition and allocation of resources must be planned; and the most effective and economical means of acquiring and using resources identified. Finally, 'optimum' processes must be selected and methods of measurement of the

product and evaluation of activities devised.

With a clear picture of broad objectives and strategies in mind, the hospital's tasks can now be identified and grouped according to function. These are:-

1.	Planning	Short, medium and long term. Definition of programmes.
2.	Financial Management	Budgeting, accounting, auditing - Business operations - accounts receivable, payable
3.	Personnel Management	- all activities and training
4.	Materials Management	Purchasing Stores Equipment
5.	Buildings and Plant Management	Grounds. Buildings and plant - Repair and maintenance Security
6.	Provision of Support Services	Housekeeping Linen Catering Transport Messengers Admissions and Reception
7.	Provision of Information Services	Medical Records Medico-legal Statistics Typing Pool and Duplicating/Printing Data processing Communications (telephone, intercom, notices, newsletter)
8.	Provision of Nursing Services	Nursing Care Nursing Training
9.	Provision of Ancillary Services	Social Services Paramedical Services Voluntary Services Hospital Chaplains
10.	Provision of Technical Services	Laboratories Anaesthetics X-Rays Gas Sterilising Medical Physics Pharmacy Technical Workshops
11.	Provision of Medical Services	Divisions Departments Units Inpatients Outpatients Theatres Laboratories

Having defined the objectives, strategies and key tasks, the blocks can now be assembled to provide the basis for a new structure (see Figure 6.4).

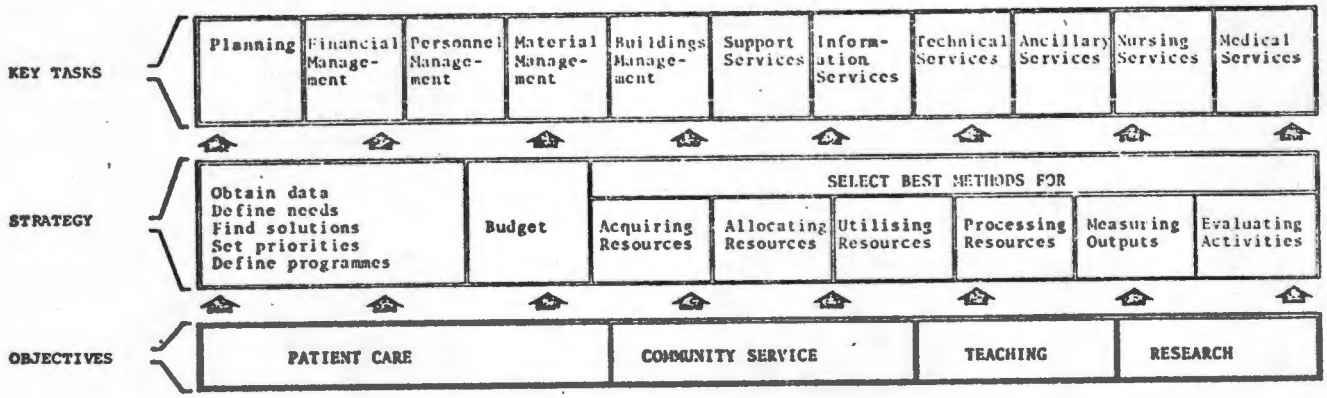

FIGURE 6.4 Building blocks for restructuring the Organisation of the Groote Schuur Hospital Group

The proposed structure provides a realistic framework for controlling and co-ordinating all the activities of the hospital, by grouping related activities into services for which specific middle management individuals are responsible and by defining programmes which are integrated and supervised by programme managers as shown in Figure 6.5. The services and programmes are directed towards achieving specific objectives economically, by optimal utilisation of all the resources of the technical and psychosocial systems. Decentralisation of many managerial functions becomes possible with its attendant advantages.

The Advantages of Decentralisation

1. Top Management are freed from routine chores--and can concentrate their energies on high level activities and relationships.

2. Management costs are reduced.
   2.1. Decision-making takes place where the appropriate knowledge and expertise are located and can be co-ordinated with other relevant decisions.
   2.2 Top Management is released from constant decision-making on 'minor' matters and can utilise their expensive time more effectively. Duplication of decision-making is minimised.
   2.3. Cost of communication is reduced by eliminating the transmission of data for decision-making up the line and consequent decisions back down again.

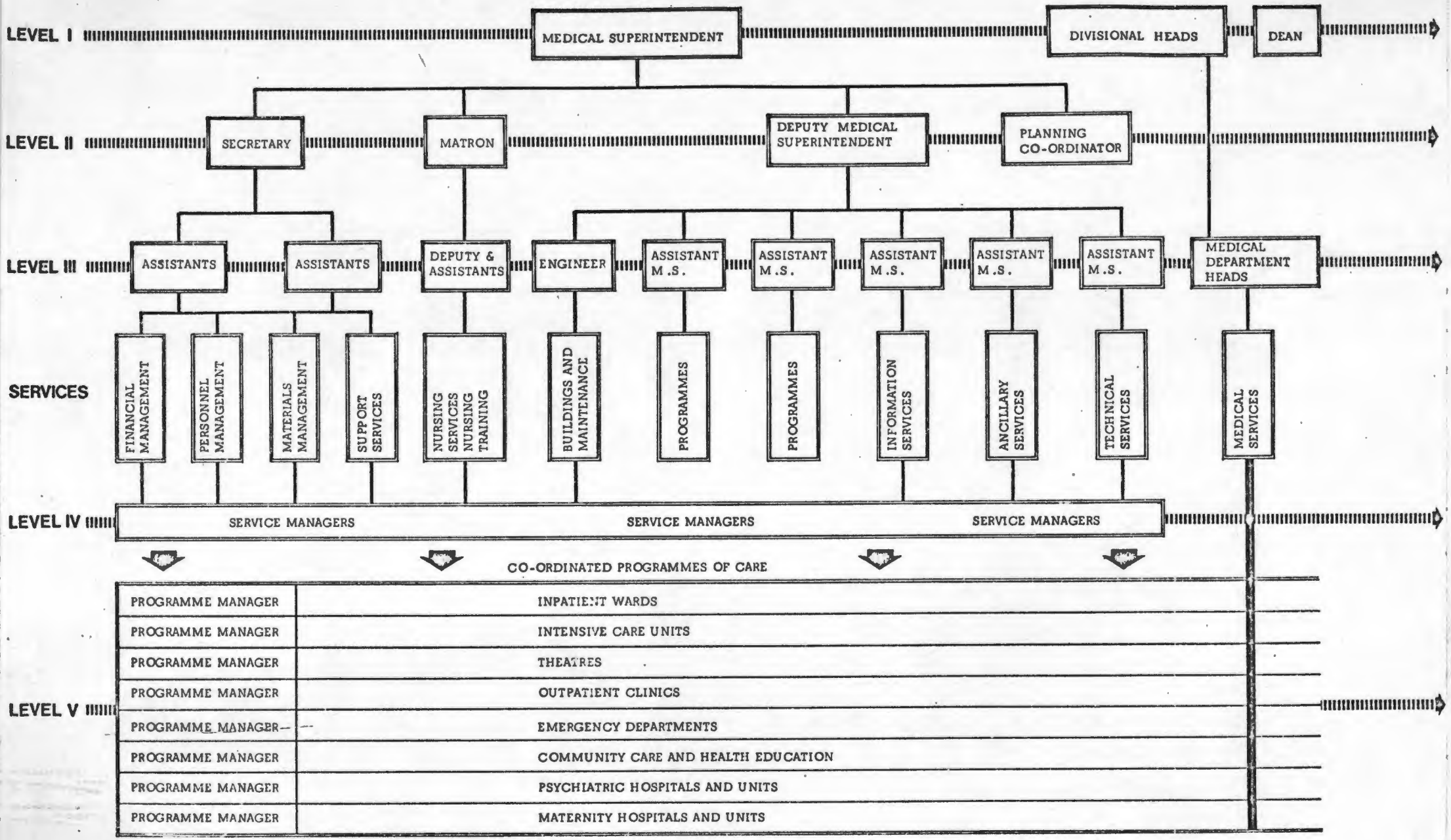

FIGURE 6.5 Proposed Matrix Structure for the Groote Schuur Hospital Group
SOURCE: Durbin and Springall, Health Care, p.98.

3. Effective co-ordination and control can be achieved by delegation of appropriate functions to service and programme managers with limited span of control but high integratory potential.[34]

4. Decentralisation improves efficiency and quality of service. Starkweather has shown that organisational performance is significantly lower in large hospitals where proper co-ordination for effective delivery of patient care services is lacking.[35] Decentralisation preserves the technical advantages of size and reduces the disadvantages resulting from lack of co-ordination and control in complex organisations.

The matrix structure is an innovative design which could effect marked improvements in the hospitals' function. Structure alone, however, is only a framework which must be integrated with the other components of the socio-technical system and requires direction in order to be viable. The managerial subsystem is responsible for directing, controlling and co-ordinating the whole.

THE MANAGERIAL SYSTEM

Kast and Rosenzweig divide the managerial system into three subsystems based on Parsons' writings.[36]

1. The Institutional or strategic level which forms one of the boundary interfaces between the organisation and its environment and is concerned with the relationships between the organisation and the environment and with overall planning, financial management and allocation of resources. In the absence of trustees or a controlling Board, the institutional role is filled by top management at Groote Schuur Hospital.

2. The organisational or co-ordinative level which is responsible for co-ordination and integration of inputs and process, for maintenance and support, and for evaluating performance and output. Senior and middle management should undertake these activities with some participation by top management.

3. The technical or operational level is where the main tasks of the hospital are carried out. It is the production level. These are the patient care, teaching, research and community service activities involving all the professional, paraprofessional, technical and general

staff whose work is dedicated to the achievement of prime objectives.

It is logical to relate these three subsystems to the proposed structure (Figure 6.5) and to explore the functions of management at the various levels and the means whereby co-ordination can be achieved.

1. Institutional Level

Levels I and II--Top Management--In the present structure Top Management--the Medical Superintendent, Deputy, Divisional heads, Secretary and Chief Matron are overburdened by routine decision-making and concern with the day-to-day affairs of the hospital. In the new structure it is proposed that responsibility for these matters be delegated to senior and middle management --Levels III, IV and V--to enable the Institutional level to concentrate on policy-making, planning, overall co-ordination and evaluation, and relationships with the environment.

It is suggested that a post of Planning co-ordinator be created at this level as shown in Figure 6.5, with responsibility for the total planning functions described in Chapter 5, in liaison with the Planning Committee, other management levels and environmental agencies.

2. Organisational Level

Level III--Senior Management--The proposed matrix indicates the functions and responsibilities of the assistant medical superintendents, defining their relationships to other senior management personnel and to the level IV and V managers. The services and programmes allocated to the assistant medical superintendents are similar to their responsibilities under the present structure, but as stated previously, this is not apparent in the chart of the existing structure (Figure 6.2) nor are the existing groupings of services and programmes as rational as those now proposed.

The Assistant Medical Superintendents and other Level III managers--Finance, Personnel, Buildings, Materials, Support, and Nursing Services should meet regularly under the chairmanship of the Deputy Medical Superintendent to report on progress, receive information on Level I and II decisions and activities, discuss problems and solutions, make recommendations and decide on action to be taken. The Deputy Medical Superintendent is acting here as a 'linking pin'[41] to co-ordinate and integrate level I, II and III functions. (See Figure 6.6)

Level IV and V--Middle Management

Level IV--Service Managers--with responsibilities for specific services should be designated to co-ordinate and control the various activities shown in Figure 6.5. Financial management for instance will require service managers to control accounting (receivable and payable), auditing, costing of departmental and unit expenditure and budgeting. Personnel management would be the responsibility of service managers for all the Staff Office functions of appointments, terminations, pensions, supplementary benefits, payroll etc. as well as manpower planning and research, recruitment, assessment, placement, evaluation and training (in conjunction with the Programme Manager responsible for staff education). Materials management would be the responsibility of Service managers for Purchasing, Stores, Equipment, Inventory control, CSSD and Linen.

The Senior Managers would be 'linking pins' between level II (top management) and the services, meeting their service managers on a weekly basis to report, discuss and decide on actions appropriate to their level. Many of the individuals already in the service at this level and at Level III will require training to fit them for these roles, which are considerably more demanding than their present functions and will require the acquisition of some theoretical knowledge if the services are to improve as intended. Ideally graduates with appropriate qualifications should be recruited for training for these positions, an objective which would require fundamental alterations to the regulations controlling appointment to the closed career system of the Administrative Division.

It must be stressed that unless the quality of the individuals who fill the senior and middle management posts is high, re-organising the structure will not achieve the desired ends and the stresses associated with change should rather be avoided.

Level V--Programme Managers

Level IV and V managers as shown in Figure 6.5 are equal in status. They are not in an hierarchical relationship to one another but have intersecting, horizontal and diagonal interactions for purposes of co-ordination. One (service) providing the means for the other (programme) to perform designated functions.

It is envisaged that Programme managers will be responsible for controlling and co-ordinating all the units that form one programme including

planning, organising, staffing, equipping, budgeting and evaluating outcomes, in conjunction with other managers with related responsibilities. Many of the functions of programme management are performed at present by senior nursing personnel (Matrons) who are well qualified for this role as discussed in Chapter 4. It would be necessary, however, to place them outside the nursing hierarchy, answerable directly to an Assistant Medical Superintendent, if they are to work affectively in the proposed reorganisation.[42]

3. Operating Level--Unit Managers

Unit managers have been used in hospitals in the United States for several years.[43]

> The Unit administrators and the ward clerks as their agents, were expected to exercise a high degree of co-ordination of all services on the wards including all support services such as dietary, environmental sanitation, transportation, and the like, even though these support services were under the line supervision of other departments.[44]

These managers function in a collegial relationship with the professional staff in the wards as members of a team responsible for the routine delivery of patient care.

This arrangement relieved medical and nursing staff of clerical and administrative duties enabling them to perform their professional functions with greater freedom. It has also been reported that most nurses achieved greater satisfaction from their work when non-professional tasks were taken over by unit managers,[45] and that quality of care is enhanced due to better co-ordination and concentration by professionals on patient care tasks.[46]

Unit managers have not been utilised in any public hospitals in the Republic as far as can be ascertained. It is not, therefore, known how effective they would be in the local situation. It is suggested that a carefully controlled trial of unit management be undertaken in two wards at Groote Schuur Hospital utilising suitably trained and qualified personnel, i.e. members of the nursing, administrative or clerical staff who show a particular interest or aptitude for such work and who could then be given the requisite additional training. If it can be shown that effectiveness, efficiency, economy, and patient and staff satisfaction are greater in these wards than in control units, the appointment of unit managers for all wards should be considered.

The managerial system in the hospital would thus function at all levels via the 'linking pins' of medical superintendents, Matrons, assistant secretaries, programme and service managers and unit managers as shown in Figure 6.6.[47] It is considered that co-ordination, control and more effective processing of all hospital products would result from implementation of these proposals--provided that the managers at all levels are given appropriate training.

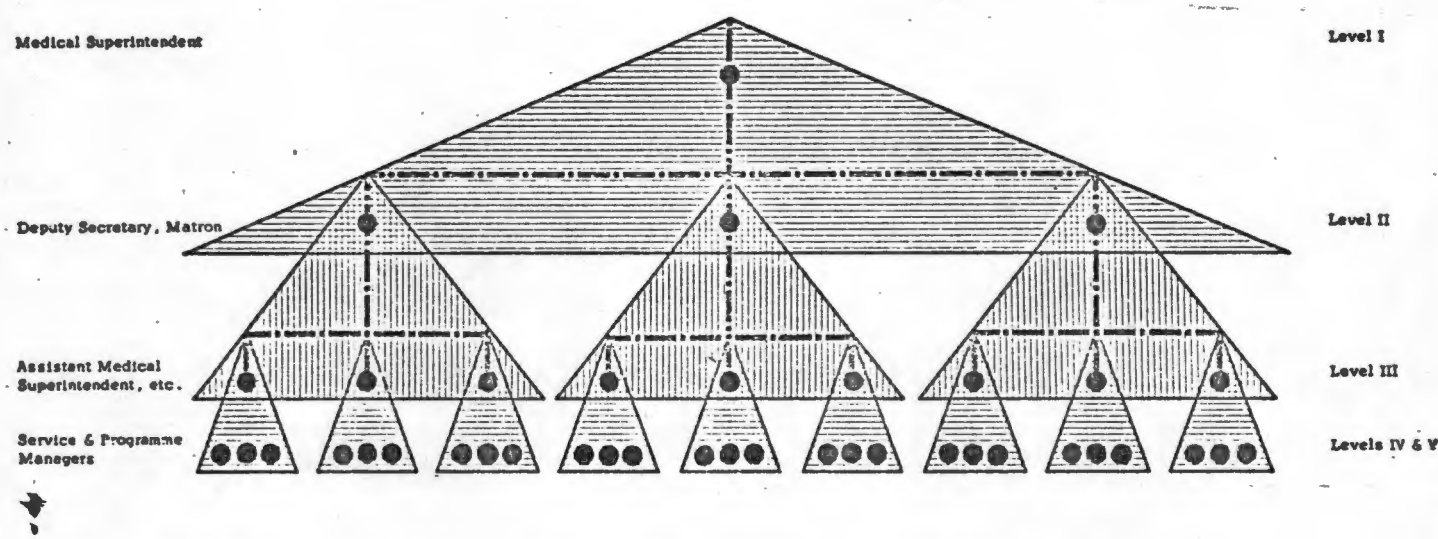

FIGURE 6.6 Groote Schuur Hospital Group: Proposed 'linking pin' relationship of the various managerial levels.

SOURCE: Rensis Likert, New Patterns of Management, p.105.

Integrators and Co-Ordinators

Organisational and operational level managers must achieve co-ordination by the possession of special skills, knowledge and personality rather than by authoritative control.

Fisher has researched the qualities required for integrators and states that good interpersonal relationships are essential in addition to certain other qualities.

> There are certain particular personal characteristics associated with integrator effectiveness. Among these are technical knowledge-ability, a balanced or inter-departmental point of view, willingness to confront conflicts, a high need for affiliation with people--combined with moderate achievement and power motives and a strong preference for taking the initiative and assuming leadership. [48]

Fisher concludes that rational--technical competence and verbal dominance, plus an ability to produce differential behaviour for different relationships are essential qualities. It also appeared from his research that integrators should not be conciliatory even when seeking co-operation but must be assertive and positive in order to succeed.[49] These are uncommon qualities. The need for technical competence and knowledgeability is compelling, however, and it is considered that suitable candidates for level IV and V posts would not be hard to find amongst the nursing hierarchy although other technical, administrative and paraprofessional personnel might also prove suitable. Suitable senior managers of all kinds will be more difficult to find. The availability of appropriate training courses would help solve the problem.

Committees

To avoid confusion in the organisation chart the committee structure at Teaching Hospital was omitted. Committees are, however, major integrating factors at the hospital, both as formally constituted and as informal ad hoc groups, and their main functions and relationships, as well as their position vis-a-vis the three levels of management are indicated in Figure 6.7.

1. The Joint Standing Advisory Committee, constituted in terms of the Joint Agreement, consists of three representatives appointed by each authority (Provincial Administration and the University) "who shall elect a chairman from amongst themselves"[37] and is established--

> for consultation between the University and the Administration in the first instance on all matters affecting the relations between the two authorities in respect of the teaching hospitals and associated services.[38]

In practice this committee rarely meets and plays a minor role in the affairs of the teaching hospitals. It is used primarily for resolution of conflict but in most instances disagreement between the Medical Faculty and the Hospitals Department is dealt with effectively at a lower level through other channels. It would seem, however, that the Joint Standing Advisory Committee could be a most valuable forum for airing and possibly resolving many long-standing problems, such as medical staff salaries, study leave allowances, restriction of funds for essential services and delays in planning and building of new facilities, and it is considered that this committee should be used more effectively.

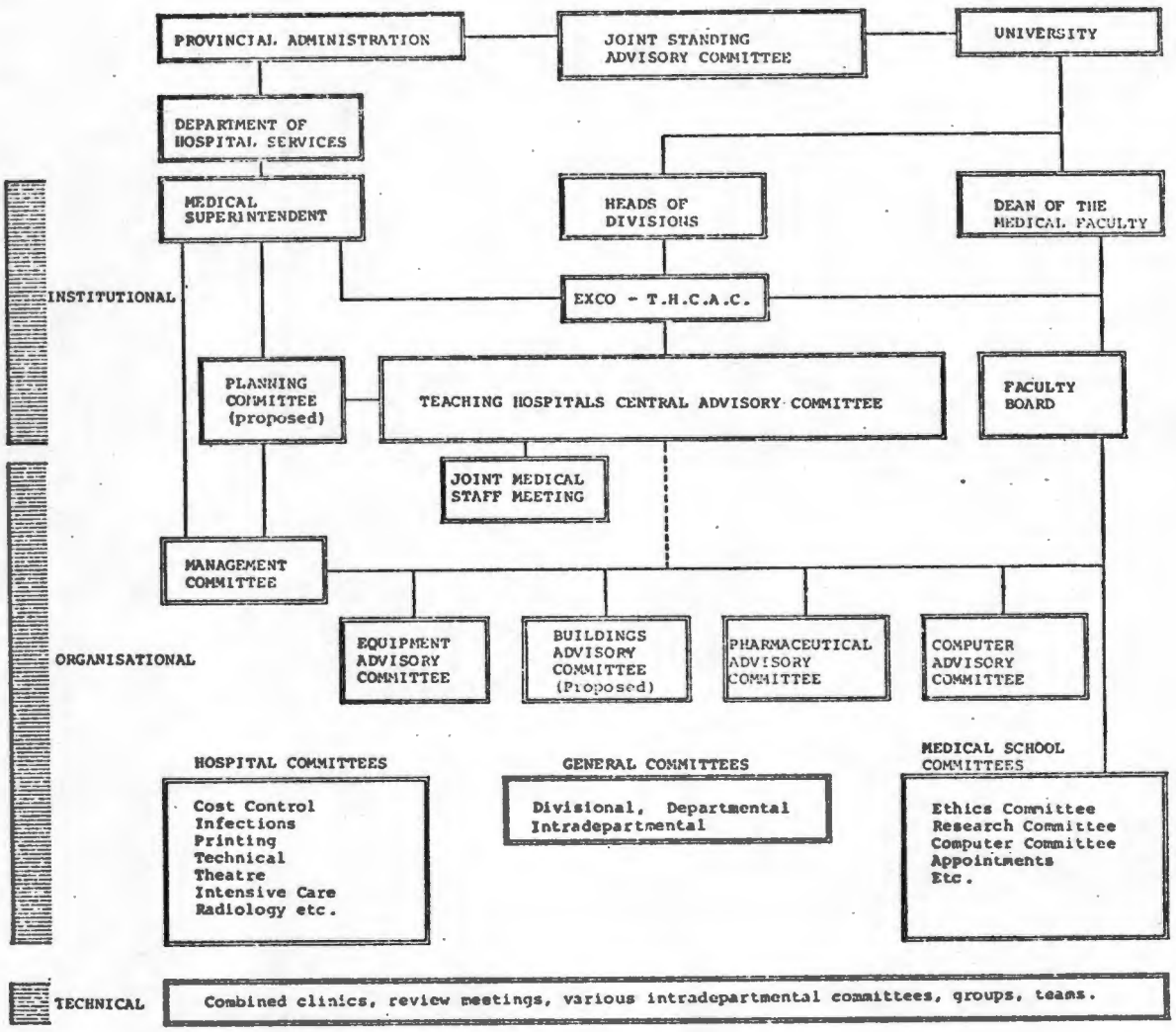

FIGURE 6.7. Groote Schuur Hospital Group: The Committee Structure

2. The Teaching Hospitals Central Advisory Committee (T.H.C.A.C.), also established under the Joint Agreement, is the highest intra-hospital decision-making body and as such, has both Institutional and Organisational responsibilities.[39] The duties of the committee have been described in Chapter 2.

The Executive Committee of T.H.C.A.C. consisting of the Medical Superintendent, (Chairman) and Deputy, the Dean and the six Divisional heads is the most powerful decision-making group in the hospital, despite the fact that all Executive Committee recommendations must be ratified by the full committee and require, in most instances, approval by the University

and the Provincial Administration.

The Chief Matron and Hospital Secretary are not members of the Joint Staff and do not attend T.H.C.A.C. meetings. As Top Management--heads of the nursing and administrative services respectively--it is anomalous that these two senior administrators are excluded from the highest councils and deliberations in the hospital. Integration and co-ordination cannot be achieved without incorporation of all top management personnel in the bodies which are constitutionally responsible for such matters. As regards the Chief Nursing Officer, Starkweather--in proposing a similar reorganisation of hospital structure says--

> The hospitals' Director of Nurses would hold no line authority over the chief clinical nurse or other nurses of each (nursing) unit. The Director's job would instead emphasise the recruitment and training of clinical nursing talent, the evaluation of patient care in the hospital, and the development of new hospital clinical services. She would be an active participant in important medical staff discussions and decisions and would sit on the medical staff executive committee. The Director of Nurses position would thus move from the level of operations to the level of overall policy and decision making.[40]

The same principle applies equally to the Hospital Secretary as head of the general Administrative services.

Inclusion of Matrons and Secretaries from all the hospitals which fall under T.H.C.A.C. would make an already unwieldy committee unmanageable and would not be of value. It is proposed, however, that at Teaching Hospital at least, the Chief Matron and Secretary should attend the fortnightly Executive Committee meetings. This would provide the missing link between the chiefs of medical, nursing and administrative services which is so vital for effective total management.

3. The Management Committee consists of the Medical Superintendent, Deputy Assistants, The Chief Matron and Deputy, Hospital Secretary and Hospital Engineer and deals with the routine, organisational level chores of administration. An analysis of decision-making by this group over a three month period showed that 87% of the decisions (254/293) related to application of rules, determination of operating policy, a need for internal information, or routine resource allocation. Only 12% of the decisions (35/293) dealt with major policies, or planning matters, or with environmental relationships at the institutional level. The remaining 1% (3/293) were unclassifiable.

It is apparent from this analysis that the management committee is dealing predominantly with organisational rather than institutional matters and that the Medical Superintendent, Chief Matron and Secretary should delegate these responsibilities to their deputies and assistants and concentrate instead on top management strategies, tasks and functions.

4. University Committees are largely irrelevant to this discussion on management of the hospital, except to note that the Medical Superintendent and Deputy's places on the Medical Faculty Board are also provided for in the Joint Agreement, which ensures cross-feed of information from the Medical Faculty to the Hospital just as T.H.C.A.C. facilitates the reverse flow.

5. Other committees which fulfil an essential role in the co-ordination of hospital activities are shown in Figure 6.7. The Planning, Building, Equipment Advisory, and Cost Control Committees have been discussed in previous chapters. The functions of the remainder are apparent from their descriptive titles.
At a lower organisational level there are several formal committees which control and co-ordinate a variety of activities, comprising personnel from a wide range of departments and disciplines.
At the technical level there are also many groups who meet informally, regularly or irregularly to plan, organise, discuss or review inter- and intra-departmental or unit functions and activities.
Figure 6.7 indicates clearly the pervasiveness of the committee system at Groote Schuur Hospital and the extent to which co-ordination and control are effected by both formal and informal groups.

The Information-Decison System

Decision-making is integral to the process of management[50] and mention has already been made of the appropriate levels for different kinds of decision-making and the advantages of decentralisation of the process. Optimally decisions and decision-making form a hierarchy so that "planning at the top level provides guidelines for the next level and so forth down through the organisation." [51]

As previously stated, the most significant aspect of decision-making in hospitals is the low hierarchical level at which most decisions on

resource-use are taken. Doctors control the consumption of 70-80% of the hospitals resources--equipment, manpower, buildings and plant. It is the medical staff at the operating level who determine admissions, discharges, investigations, treatment, need for special care, length of stay, number and frequency of return visits, conversion of research projects into patient-care programmes and many other activities. It is, however, beyond the scope of this work to study the various classifications of decisions and decision-making in greater detail. There is a comprehensive literature on the subject which can be studied with benefit.[52]

It is important, however, to appreciate that rational decisions cannot be made at any level without information. Management must be informed as to the existence and nature of problems, must know what the needs are and the range of possible solutions and consequences and, finally, must be given feed-back on the results of decisions taken.

This process forms the classic cybernetic loop which results from information--decision--feedback--decision as shown in Figure 6.8 which illustrates the on-going nature of the decision-making process and the need for information at all stages.

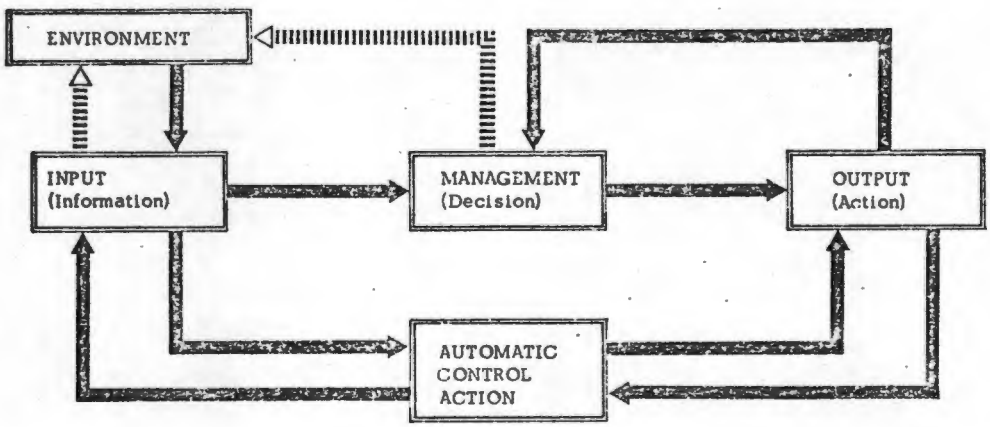

FIGURE 6.8. Information Flows and the Decision-making Process

Each decision initiates action which generates the need for new decisions in a constant cycle, with feedback of information and new input from the environment providing the basis for the next series of decisions. Control at many levels is achieved by built-in, automatic reactions to routine situations--so that active decision-making by management is un-necessary.

This simple diagram also illustrates the need for information to be communicated to the appropriate operating level so that decisions can be

implemented and action taken.

Information Systems

> A specific decision depends on the analysis, interpretation and evaluation of information that is available to the decision-maker ... It is quite apparent that the decision-maker can be deluged with information if he does not know how to select data that are pertinent to his problem. [53]

Lack of information is as much of a problem for management as information overload and upward channels of communication must be carefully maintained to ensure that problems are recognised early and that new ideas and proposals are received and studied. Informal communication networks are as important as formal channels and should not be discouraged by insisting that 'correct' channels must be followed. Information flow must, however, be controlled or the system becomes chaotic and inefficient[54] or--alternatively--if information is inadequate or delayed, managerial efficiency can be seriously impaired.

Groote Schuur Hospital suffers from a combination of all three problems--overload on one hand and deficiency and delay on the other. Information on resource utilisation and data for evaluation of methods and procedures is either not available or is stored in an inaccessible format. Valuable information is painstakingly captured for computer processing and then deleted from the files without analysis. Other essential data is recorded and stored by manual methods but cannot be collated for analysis due to complexity and volume. The analysis and presentation of information for various levels of management will be discussed in the next chapter and suggestions made for improving the process.

Confidentiality--Communication between doctor and patient is regarded as protected information. Hospital management therefore has an obligation to ensure that patients' medical records are treated as confidential and that no information about a patient is made available to any other person without the patient's consent--except by court order. The advent of computerised hospital information systems makes this responsibility far more onerous and stringent safeguards must be built into the system to avoid the possibility of misuse of confidential information.[55]

Professional secrecy is an ethical value prescribed for the protection of the patient. Bureaucratic secrecy on the other hand is a device for the protection of bureaucratic authority and is seldom justified, serving merely to obstruct the free flow of information and to retain power in the hands of

the secret-holders. Organisational ends are not generally served by preserving the confidentiality of so-called official secrets and this dysfunction of bureaucracy should be guarded against.[56]

Communication Networks-- The problem of communications in organisations is psycho-social rather than technical. The effectiveness of the information system is dependent ultimately on the people who use it, regardless of how efficient the techniques for collection, storage and analysis of data may be. Dissemination--lateral, vertical and diagonal--and reception of information, can only be achieved if the human element in the communication network is functioning properly.

Communication in hospitals has been studied extensively by Revans and others in a group of London Hospitals in a project, Hospital Internal Communications. The study arose from Revan's initial research into the morale of nursing staff in Manchester Hospitals, which convinced him that lack of communication was responsible for the extreme anxiety and uncertainty which characterises hospitals and which resulted in alienation, poor morale, and high sickness and drop-out rates among nursing staff.[57] The Hospitals Internal Communication project which lasted for several years did not in fact accomplish its objectives. The attempt to institute by means of surveys an action-learning process amongst hospital staff was partially successful, depending on individual hospitals and people, but it appears that major changes in staff attitudes and improvements in patient care were not effected.[58]

A subsequent review by Revans himself, written ten years after the project started is more optimistic and indicates that the process of 'autotherapy' proposed by him has indeed borne fruit and that the methods used--with adaptation--may well be worth emulating.[59]

The Brunel Institute of Organisation and Social Studies has published a progress report on the Brunel Health Service Organisation Project which by means of 'social analysis' is investigating a wide range of organisational problems in the North West Metropolitan Region Hospitals (London). This investigation has been based on group discussions and conferences between many different levels of hospital staff and the research team, and has clearly resulted in improved communications in the hospitals studied--although this was not the prime purpose of the project.[60]

Similar studies have been undertaken in the United States on Organisation Development (O.D.) but are not as fully documented as the U.K. projects.[61] It is considered that these reports should be carefully studied and serious consideration given to the development of similar projects at

Teaching Hospital where a need for improved communications--by any and all criteria--is clearly apparent. Action-learning, social analysis and O.D. Team Building all offer an innovative and seemingly worthwhile approach to better communication and better management in the hospital.

SUMMARY

The inputs to the hospital system must be processed and converted to outputs--the hospital's product. Conversion takes place via the organisation's socio-technical system which consists of the goals and values of the participants and the psycho-social, technical, structural and managerial subsystems.

The values of the participants exert a strong influence on individual, social and organisational goals, resulting in multiple and possibly conflicting goals. Hospitals are fortunate in employing people whose individual and professional goals and values form a normative structure which provides a powerful integrating force and has high congruence with organisational goals. Professionals also, however, internalise professional goals and conflict with the organisation may occur with regard to means of achievement rather than in respect to the goals themselves. Although suppressed conflict may be revealed by clearer definition of Groote Schuur Hospital's objectives, these should be determined, in consultation with all participants, in order to clarify the hospital's role and function and to facilitate future planning.

The structure of the organisation forms the framework upon which the other subsystems depend. The structure comprises the formal organisation, all informal relationships and the policies, rules, codes and procedures which regulate the hospital. The organisation chart of the present structure is confusing and does not indicate the complexity and polycentric nature of the Groote Schuur Group. An alternative matrix structure is proposed which clarifies many of the existing relationships and defines managerial relationships at different levels. The matrix structure facilitates decentralisation and enables top management to concentrate on institutional relationships, policy-making, financial control and overall co-ordination, delegating routine matters to lower organisational and operating levels. Horizontal as well as traditional scalar relationships can develop which should improve co-ordination of all services and programmes.

Each level of management has specific tasks which must be appropriate to that level and which can be more effectively performed by programme, service and possibly unit managers working in teams with the professional staff. These managers have an important integrating function and should have particular qualities and special training to enable them to accomplish organisational objectives and to act as 'linking pins' between different managerial levels and the technical level teams.

The functions of the managerial system are enhanced by the many committees which function as powerful co-ordinating bodies in the hospital. The information-decision subsystem is a primary concern of the managerial system. The free flow of information through the hospital is essential for effective decision-making but control must be exercised to ensure that information is timeous, accurate and not overwhelming. Computerised information systems can be of great assistance in providing information to management but must be carefully designed and controlled to avoid information overload and to protect the confidentiality of patient and personnel records.

The free flow of information is dependent not only on technical processes but also on effective communication between people. Several projects have been reported which stress the importance of communication in hospitals and these require careful study to assess the possible application and utilisation of action learning, O.D. and similar methods in the organisation and management of Groote Schuur Hospital.

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7. THE PRODUCT

The final stage in studying the hospital as a system has now been reached--necessitating analysis and evaluation of the hospital's product.

In earlier chapters both the functions and the goals of the hospital were outlined and it is apparent that the functions of patient care, teaching, research and service to the community are also broadly speaking, the goals and the product of the hospital. Katz and Kahn state that organisational functions and objectives should be thought of "not as the conscious purpose of group leaders or group members but as the outcomes which are the energic source for a maintenance of the same type of output".[1]

Keeling distinguishes between output and outcome by describing outputs as the product of the inputs which contribute to the achievement of objectives, whereas outcome is the measurement of the extent to which the achievement is attained. In other words there are two important relationships in the use of resources

1. Input to output and 2. Output to outcome[2]

Both these factors must be considered when evaluating the product--which is both the actual unit of production (output) and the quality, in terms of effectiveness and efficiency of the product (outcome). Teaching Hospital's product can therefore be viewed both as the output/outcome which is recirculated as renewed input or as the output/outcome--resulting from conversion of inputs.

The first approach requires examination of the product--treating patients, trained staff, results of research, contributions to community health and welfare and the re-entry of these products into the system as returning patients, manpower, new theories, technology and treatment, and the effects of changing community attitudes on availability of resources. The latter may lead to increases or reduction of input, depending on a variety of environmental factors, including the public perception of the validity of the hospital's activities.

> The amount of support which an organisation receives from its social environment is also affected by the information which elite groups and wider publics have acquired about its goals, activities and accomplishments. [3]

The second option considers the same ends but is not concerned with the complex and unquantifiable psycho-social, cyclical aspects of input/output systems. Restricting the study to the simple input/output relationship makes it possible to concentrate on more measurable assessment of the product and its quality. It is the intention in this chapter, therefore, to use the latter approach to consider measurement of the hospital's output and the extent to which outcome meets the goals and objectives of the organisation.

Emphasis will be placed on the outcome of patient care rather than on teaching and research as it is considered that patient care is the hospital's primary objective and that the other functions are secondary. Furthermore, research and some teaching are predominantly University responsibilities whereas this work is mainly concerned with the Provincial area of responsibility in the hospital--patient care.

OUTPUT--THE QUANTITY OF THE PRODUCT

Analysing the hospital's output of treated patients presents problems in distinguishing between measures of process, activity, utilisation and true output. Many of the definitions are unclear and the available texts use terms interchangeably.

The dilemma is exemplified by Fanshel and Bush,

> At present, for the structural elements of the system, the emphasis is on their activities, not their outputs; thus, the usual indicators are caseload, ratio of beds to population, nurse utilisation, cost per day and the like. These measures could become more useful if we could establish what the end product or outputs, of the system are.[4]

For the purpose of this work therefore, any statistics relating to the quantity of patient care will be considered as measures of output--realising that many of them are concerned with events rather than individuals,[5] and relate to activity rather than output.

The requirements for collection of certain basic data to record hospital activity are similar in most countries and includes simple counts of events as indicated in Figure 7.1.[6]

	1974	1975	1976
Admissions	57 559	57 434	56 984
Deaths	2 095	2 047	2 128
Discharges	54 534	54 444	54 013
Patient days	497 301	498 450	479 079
Average Daily Census	1 314	1 377	1 285
Outpatient Attendances	966 690	1 200 595	1 203 145
Operations	32 794	32 483	32 516
Obstetric Deliveries	16 171	18 379	18 694

FIGURE 7.1 Groote Schuur Hospital Group: Activity Data (1974-1976)

These statistics can be collected in many different categories--indicating specifically medical or surgical admissions and attendances, or pertaining to particular wards and units. In addition, individual departments record their own activities in regard to procedures or investigations performed, specific therapeutic regimes completed or case work done. The method of collection of data is, unfortunately, not always specified and each institution or even each department may make its own rules for measuring activity.

The need for a record of activity as distinct from measuring output is a basic cause of the defects in most data collection. If, for instance, a department wishes to measure the activity of personnel they will record work done in units of time e.g. 20 minute periods of physiotherapy treatment. If, however, the output of the department is to be measured it is necessary to know how many patients were treated. For general hospital purposes on the other hand, the number of treatments given to individual patients, or investigations or procedures of all kinds, received by the average patient, may be required.

It becomes apparent that the purpose for which the information is required must first be ascertained and clearly defined before the data is collected. Furthermore, the method of counting must be precisely specified so that all hospitals record activity or output in a uniform manner to ensure comparability.

Purposes for which information is collected

Output information is required mainly for administrative purposes. The most important uses are--

1. Costing - Inpatient day costs
   Outpatient attendance costs
   Departmental costs
   Cost of investigations, procedures
   Catering costs
   Pharmacy costs, etc.

2. Measuring Resource Consumption -

   Number of personnel/patient/Procedures/unit
   Supplies used/patient/procedures/unit
   Drugs issued/patient/unit, etc.

3. Assessing utilisation -

   Hospital activity data
   Staff employed and their allocation
   Long stay patients
   Meals served
   Pharmacy items dispensed, etc. etc.

4. Planning

5. Budgeting

Note: Billing is omitted as this is not a requirement for the Groote Schuur Hospital Group, where charges depend on income and not services rendered. There is a sliding scale of fees which is different for inpatients and outpatients.

Knowing the purpose for which the information is required, the type, quantity, source and destination of reports can then be determined.

Simple counting is a mandatory activity for all Cape Provincial Hospitals and the method of counting and calculation is clearly defined for inpatient admissions, discharges, deaths, census, patient days, bed occupancy and operations performed.[7] Considerable ambiguity and uncertainty exists, however, about the recording of outpatient visits/attendances and the counting of laboratory tests, other investigations and various therapeutic procedures. It is essential that measurement of each item be standardised and the standards applied to all Provincial hospitals, if the data which is so laboriously collected and analysed is to be of any value. Sheps has emphasised the importance of comparison, stating that with any measurement, comparisons are made or a baseline established for future comparison. "Comparison lies at the basis of all measurement".[8]

Measurement implies a comparison against a mark on a scale. The marks are meaningful only in terms of established norms, of earlier units on the same subject, or of readings obtained from another subject.

An attempt is now being made to test a very basic method of data collection at several Cape Hospitals and it is hoped that this will develop into a measurement system with wide applicability and comparability.[9]

Output is a comparatively simple quantitative concept, requiring relatively little effort to collect, store and analyse. Outcome measurement however, is more complicated and there appears to be minimal agreement on precisely what is required or how to obtain it.[10]

OUTCOME

Before outcome can be evaluated the hospital must define its objectives. The problems associated with such definition have been discussed in a previous chapter and the need for goal definition stressed. It is generally agreed, however, that the primary goal of health care is benefit to society. It has even been suggested by Ashford that

> Management should be mainly concerned with services to people rather than with the performance of organisations and motivation.[11]

To support such a contention would be both inefficient and ineffective but it serves to emphasise that hospitals work within the terms of reference of their return to society, and that information for evaluation of hospital services and their benefit to people (patients and others) must come from both external and internal sources.

External Measures of Outcome

External factors on which information should be obtained relate to the effects of hospital-care contact on the patient, the family, society, commerce, industry and the economy.

The 'need to know' whether an individual institution is in fact contributing to the improved health, welfare and prosperity of the society it serves is real and requires quantification as well as qualitative description.

Health Status Indicators--This is a field where general health indicators would be of considerable value to facilitate comparison between national as well as individual institution's achievements. Morbidity and mortality statistics (including neonatal and maternal deaths), disease incidence and

trends, life expectancy and other basic data are commonly available in most industrialised and to a lesser extent in semi-developed countries. This information is utilised extensively by various Government departments concerned with trends and averages--and by insurance companies--but is seldom used by individual hospitals as criteria for assessing achievement and is almost certainly too broadly based to be reliable for this purpose. The use of sickness benefit or death certificate data for evaluation of health services has been viewed as a breach of confidentiality in the United Kingdom--although adequate concealment of individual patients' identities must be possible.[12]

The Health Interview Survey in the United States is a household survey designed to obtain information on all forms of illness, impairment of function, injuries and utilisation of health services, from an annual sample of 42 000 households. Analytical studies of morbidity have been derived from these surveys but the data has not been linked to the effectiveness of health services on a comparative basis.[13]

Kohn and White reporting on an international collaborative study of the use of health care services by twelve study populations in seven countries, conclude that perceived morbidity is a valuable guide to the need for and utilisation of health services, but have regarded their findings as relating to input rather than to outcome of health services. They claim, however, to have developed various measures of morbidity which can be used as an index of health.[14]

Health Indicators in general are still in a very early stage of development. Fanshel and Bush state categorically "to date there is no indicator that can fairly be called a Health Status Index".[15]

Most research into this subject has concentrated on the function of the individual in his daily activities, as being central to the concept of health and have attempted to quantify function in a variety of circumstances.[16] Fanshel and Bush propose the use of other weighted values, in addition to measures of function, to provide a Health Status Index. Their Index measures the effectiveness of health care programmes in dysfunction-free days/year enjoyed by treated patients, which can then be weighed against the cost of treatment to test the cost/effectiveness of health care programmes.[17] The Index can also be used to quantify the output of health services and other social programmes.[18] Further developments on health status indices have been reported which attempt to refine quantitative measures for function

and dysfunction and for debility, and to place a value on the conditions of life.[19]

Investigations into measures of health status have been directed not only to morbidity and invalidity but also to the extent to which the sick person may be a burden or danger to others--and the chance of recovery without intervention. A report from a technical discussion of the World Health Assembly proposes three indices.

1. Life Expectancy Years--a measure of the shortening of life as a result of disease without intervention which could be developed for application to specific disease entities.
2. Person Years in Good Health--a measure of the number of years of good health made possible by interventions which reduce or limit the natural course of disease.
3. Validity Years--a measure of health gain where complete recovery is unlikely but where intervention will reduce the degree of invalidity.[20]

If health gain can thus be quantified, this can be set against the costs of treatment and prevention and the costs incurred by society in obtaining treatment for the patient--such as loss of productivity at work; cost of replacing the patient at work; cost to the family--loss of earnings, cost of replacing the woman in the home, transport costs, and health insurance and death expenses.[21]

It follows that diseases can then be classified in several ways.

1. High cost - high gain
2. High cost - low gain
3. Low cost - high gain
4. Low cost - low gain [22]
5. Various intermediate combinations

It thus becomes possible to allocate resources to those diseases and therapies which will render the greatest benefit at the least cost--if ethical considerations do not dictate otherwise. Society can at least make an educated choice if it wishes to do so.

Other less tangible outcomes of health services have also received a great deal of attention but not quantification. The poor correlation between increasing input and seemingly static output of health services; the increase in 'psycho-somatic' illness; the indirect costs to the community of perceived morbidity; the effect of rising expectations and demand, health insurance and

availability of health services on public health (or ill health); and the 'sick-role' and its effect on society, have been examined by many writers including Cochrane,[23] Feldstein,[24] Illich,[25] Shain and Roemer[26] and Parsons.[27]

It is apparent that there is a need for a micro-model to measure the health status of individuals and for a macro-model for analysis of populations. In evaluating the outcome of hospital treatment the micro-model is more relevant to this discussion and it is suggested that much valuable information could be collected by Provincial and State Health Departments to provide feedback to health services, including hospitals, for comparison and evaluation of achievement. The same data could also be applied in the wider context of a national health profile. Development of Health Status Indices for analysis of health service outcomes, would be a valuable research project for funding by the Medical Research Council on a multidisciplinary basis.

Subjective Feedback from the Community--A source of external information on the hospital product, which is virtually untapped, is public opinion. Market research into consumer satisfaction (and needs) is a rich field for potentially valuable feedback on the outcome of hospital care.

1. Surveys--Opinion surveys based on random or selected sampling, questionnaires, skilled interviews and expert appraisal would indicate clearly how the hospital and its services are viewed and valued by the community, as well as providing insight into particular areas of inadequacy and poor quality--as perceived by the consumer and his family, friends, employers and associates.[28] Several surveys have been done to elicit patients' views on their hospitals.[29] A survey, based on the questionnaire compiled by Raphael for the King Edward's Fund, was conducted at Groote Schuur Hospital during 1977.[30] The results were informative and useful, comparing satisfactorily with the findings reported by Raphael who surveyed a group of London hospitals.[31] Follow up on the Groote Schuur survey has resulted in changes being made to hospital visiting hours, serving of meals, availability of reading matter and radios, and improved management in two wards where patient satisfaction was markedly less than in other wards in the survey. The questionnaire itself proved to be an unsatisfactory instrument which invalidated the findings for research purposes and the full report has not, therefore, been included in this dissertation. The

survey will, however, be repeated, with better formulated questions, and it is intended that this should become a regular and on-going analysis of patient opinion.

2. Consumer Representation--In the United Kingdom, two mechanisms for representing the general public in health service affairs and for ensuring an effective complaints procedure (which is an indication of outcome) were instituted in the Re-organisation of the National Health Service in 1974--Community Health Councils and an Ombudsman--the Health Service Commissioner.[32]

The Community Health Councils were established to provide a forum for constructive criticism, comments and complaints, about gaps or defects in the Health Service, on behalf of the public. The Council have right of access to hospitals, are entitled to a hearing from health authorities, to be consulted on planning and changes in their districts and to receive answers to their queries. In addition to a duty to inform the Area Health Authorities about public needs, they also act as public watchdogs to ensure that complaints are adequately dealt with and to provide an external check on hospital and other health service procedures.[33]

A Council exists in every district in the United Kingdom and consists of 20-30 members--half of whom are appointed by local authorities, one-third by voluntary organisations and the remainder by other bodies. The creation of the Councils, by separating management from representation of community interest, introduced a new concept into the National Health Service and provided an important channel for effectively voicing public opinion on hospital affairs. The Council acts independently of the Area Health Authorities (AHA) but should, if possible, act in concert, rather than in conflict with the AHA.[34]

The office of Health Service Commissioner (Ombudsman), which is held concurrently by the Parliamentary Commissioners in England, Scotland and Wales, was created to provide an external review mechanism for those consumers who are dissatisfied with the outcome of complaints to health service authorities. As Parliamentary Commissioner, the incumbent of the office may only receive complaints through Members of Parliament but as Health Service Commissioner he may act on complaints from individuals or on behalf of individuals, has wide powers of investigation and may exercise considerable discretion, but is limited in the matters which he may investigate--maladministration and failures of service falling within his jurisdiction; clinical matters, personnel

matters (i.e. complaints from personnel on their own behalf--not complaints against personnel), action that may fall within the jurisdiction of the courts or an Inquiry, and contractual or commercial transactions being excluded.[35]

In Holland democratisation in hospital planning and decision-making has been investigated and implemented with the intention of encouraging participation by Society, patients and employees in hospital affairs--and the appointment of an Ombudsman for hospitals is proposed.[36]

In the United States, Health Systems Agencies represent consumers with increasing vociferousness[37] and efforts are being made to introduce Ombudsmen into hospitals to represent patient's interests.[38] In contrast to these developments in Western, industrialised nations, there are very limited, independent, external mechanisms to allow for representation of consumer interests in patient affairs in hospitals in South Africa.

Proposals for Community Representation for the Groote Schuur Hospital Group.

The Teaching Hospital Board, the members of which are appointed from nominated representatives of local authorities, Provincial Administration and various voluntary organisations, and other interest groups such as the University, is one of the few organisations associated with the administration of the hospital, which represents the consumer.

The Board functions, however, as an arm of management, not as a consumer group except (as empowered by the Hospitals Ordinance) in regard to waiving or reduction of fees and the consideration of complaints made by patients or other members of the public.[39] This latter function is seldom if ever performed, as complaints are made directly to Hospital Management in most instances and dealt with at that level. Advisory Committees have also been appointed, by the Administrator of the Cape Province, for the two hospitals in the Group which are responsible for the treatment of alcoholics. The functions of these two Committees are poorly defined and attempts are now being made to encourage the most recently constituted committee to act as a liaison with the general public, to assist with education of the community, and to provide information on public needs and opinions of the institution.

It is considered that the functions of the Board and the Advisory Committees require re-examination and that much greater emphasis should be placed on their role as community representatives. Thought should also be given to a broader base for nominations to these bodies, to ensure representation of the whole community served by the Group.

Satisfactory machinery for channelling complaints and suggestions to the newly responsible bodies would require organisation. The Code of Practice suggested by the Committee on Hospital Complaints Procedure, provides practical guidelines and proposals which are suitable for use by the Groote Schuur Hospital Group.[40]

Although perceiving a very real need for an Ombudsman in local health and other services, it is felt that the establishment of such an office is unlikely in the Republic at this time. There can be no doubt that an Ombudsman with effective power is an invaluable check on bureaucratic ineptitude and provides a most desirable, fair and unbiased 'court of appeal' for the public--patients and others--against monolithic bureaucracy and professional autocracy.

Malpractice suits--Litigation against hospitals is not as yet a significant problem in South Africa. Malpractice suits have, however, grown to alarming proportions in the United States where the courts monitor the performance of hospitals, hospital personnel and private practitioners. This process does serve to measure the effectiveness of health care outcomes on individuals but its effect on medical care overall is difficult to assess. It is not, however, the purpose of this study to consider malpractice litigation, which has been mentioned merely to complete the discussion on various external methods employed by Society to evaluate and influence Health Service outcomes.

Internal Measures

Internal measures of outcome are those collected by individual institutions to measure their own performance. If several institutions collect comparable data, these can be collated by a central agency and the performance of all institutions compared against one another or against predetermined criteria or standards.

Many of the measures which are traditionally used for analysing outcome are in fact measures of structure or process and assess hospital performance, procedures and utilisation rather than the treated patient's change in health status.[41] There is a strong causal relationship between structure, process and outcome and they are not always separable.[42] The discussion which follows on measures of effectiveness and efficiency will therefore cover all three aspects.

Efficiency can be defined as the ability to use resources to their optimal potential.

Furthermore--

> Efficiency is related to the costs of achieving an outcome..... the ratio of cost to benefit... and should always be related to the outcome of the total process. [43]

Efficiency relates to the way in which an outcome is achieved and is mainly concerned with measures of performance and outcome in terms of expenditure.

According to Katz and Kahn--

> Efficiency is primarily a criterion of the internal life of the organisation and is concerned with the economic and technical aspects of the organisation. [44]

Such parameters as bed occupancy; length of stay; length of waiting list or delay before admission for 'cold' treatment; complications; recurrence and re-admission rates, can be interpreted as measures of efficiency as can bed-turnover rates and staff:patient ratios,[45] outpatient waiting times and delays in scheduling investigations.[46] Autopsies are indicative of diagnostic and therapeutic efficiency. Autopsies as a percentage of deaths per annum have declined steadily from 34% in 1966 to 25% in 1976 at Groote Schuur Hospital (see Figure 7.2).[47]

	1966	1976
Admissions	33 445	47 108
Deaths	1 614	2 103
Autopsies	553	535
Autopsies as percentage of deaths	34%	25%

FIGURE 7.2 Groote Schuur Hospital Group: Autopsies performed (1966-1976)

The decline is largely due to improved diagnostic techniques which assist in confirming the diagnosis, without the need for autopsy and to a variety of other factors.[48] The post-mortem, however, is an invaluable tool, unequalled as a measure of diagnostic accuracy and medical performance and every effort should be made to increase the percentage to at least 1966 levels.

Information needed for measuring efficiency--Abel-Smith's committee which was appointed to explore the application of economic principles to health services, recommended that activity units -- units of measurement for resources used--

should have four characteristics.

> Uniform Application - They would have to be sufficiently closely defined for the system to be uniformly applied, not only within an area, but throughout the whole country.
>
> Acceptable Accuracy in costing - They would have to be capable of being costed with sufficient accuracy for indications of cost or resources used to be given within acceptable margins of error.
>
> Usefulness for Medical practitioners - The groupings of diseases would have to be usable by doctors in any setting.
>
> Outcome oriented - The units used for resource information would have to be units which, when costed, could be compared with the relative success or failure of using such resources. [49]

1. Uniform application and collection of activity units will ensure comparability of information for evaluation of hospital efficiency. The Cape Hospital study mentioned earlier can only be viewed as a feasibility study. Responsibility for standardisation of methods of measurement of health care activities must be accepted by the Department of Health for countrywide use, as effective co-ordination can only be achieved at Central Government level.

2. Acceptable Accuracy in costing--Both outcome and output measures must be related to the resources consumed in production, if efficiency is to be meaningfully measured. It is necessary to be able to calculate the cost per patient day (inpatient) and per attendance (outpatient). The cost of treating specific diseases or performing particular investigations or procedures should be calculable, and comparable with predetermined norms for these activities, or with national averages.

At present no mechanism exists in Cape Hospitals for routine costing of diseases, procedures, therapies, functions or departments and cost accounting and functional or programme budgeting can only be done on an ad hoc basis by special surveys which are time and labour consuming. Routine, accurate cost-accounting of all hospital activities would enable management to evaluate efficiency in quantitative terms and to relate resource consumption to the outcome of defined programmes of care.

3. Usefulness for Medical Practitioners--It has been stressed by Heasman and his co-workers that reports must be timeous, comprehensive and relevant if the co-operation of the medical staff in collection and utilisation of clinical data is to be gained.[50] Yates describes marked resistance, on the part of clinicians, to attempts to coerce them into management of clinical work and stresses the need for inducements, to persuade medical staff to use information for improving both process and outcome of hospital care.[51]

4. Outcome-oriented--Measures of the efficiency of resource consumption must be developed, which relate utilisation and costs to the health status of the treated patient. These would be true measures of efficiency of the outcome of patient care, few of which are obtainable at present. The incidence of complications and re-admission rates are comparatively easy to measure and methods of acquiring this information are being investigated at Groote Schuur Hospital.

Other measures which are concerned with the efficiency of process rather than outcome, are waiting lists, bed occupancy, outpatient waiting times and staff: patient ratios which should be regularly reported for analysis.

Methods of Data Processing--It is apparent that well-designed data-processing systems are essential for sorting, filing, linking and reporting the voluminous and complex data needed to provide useful information for assessment of efficiency.

1. The systems must be able to produce reports for individual wards, units, departments and laboratories as well as for each hospital and the Group as a whole.

2. The principle of exception reporting should be applied, so that only variations above or below certain prescribed maxima or minima would be routinely reported. Annual reports giving full details would provide the baseline criteria.

3. Information must be timely, accurate and clearly presented in an easily readable format.

4. Greater use should be made of computerised data processing.

There are several Provincial Computer systems, incorporating Groote Schuur Hospital, already in existence.

These include - Personnel (payroll and establishment)
Admissions and discharges (for fees purposes)
Payment of accounts (expenditure)

In the development stage - Stores (expendable items including medicines)

In addition, the Hospitals Department and the major teaching hospitals, in conjunction with other Provincial Departments, are currently developing a patient-oriented real-time hospital information system. Groote Schuur Hospital also maintains several off-line batch projects, including a comprehensive 'medical summary' record system in which patient discharge data is summarised.

None of these systems are linked or are used for routine management reports. Much valuable information is being collected and every effort should be made to ensure that this costly effort is worthwhile. Future development of the Cape Hospital Information system will resolve some of the problems but intensive effort should be directed toward obtaining more information for management from all the data available.

Recommendations

In the interim a combination of manual and electronic data processing systems can be more effectively used than at present to provide information on activity, utilisation, costs and efficiency.[52] These should include the following for Administrative purposes--

Already available: All output data as described. Length of stay.
Costs--inpatient days, outpatient attendances, meals.
Number of personnel employed.
Staffing and activity of Paramedical Departments.
Nursing establishment.
Total expenditure--in line budget format.

Additional required: Patient:Staff ratios (total and in categories).
Staff turnover rates (in categories).
Waiting lists. Bed Turnover rate.
Incidence of Complications (e.g. post-op infection).
Readmission rates, Autopsy rates.

In addition, one or two special surveys of selected activities should be done each month, covering various services and programmes--such as Blood Bank, and cost and utilisation of blood products; or the electrocardiogram service--costs, use and activity. These reports would be of clinical as well as administrative interest and would be useful indicators of resource use. In time these findings could perhaps be linked to outcome to provide measures of efficiency.

For clinical purposes other information would be of value.

The discharge data from the 'medical summary' is used predominantly for research at present. Its function could be extended to the production of routine reports for management and Heads of 'firms' to facilitate systematic, critical evaluation of clinical work.
Information which could be made available to clinicians includes

1. The number of patients treated-by diagnosis and firm.
2. The number and type of operations performed-by diagnosis and firm.
3. The distribution of diagnosis by age, race, sex.

4. The duration of stay by diagnosis and firm.
5. Complications, relapse, recurrence and readmission by cause.
6. Mortality or other outcomes by diagnosis and operation.
7. Post mortems performed and correlation with ante-mortem diagnosis.
8. Other--as requested.[53]

It should be possible to arrange for similar information to be made available from other institutions on a quarterly basis for ongoing assessment and comparison of performance.

All these data must be considered as a totality. Information on expenditure alone may indicate cost-savings as an outcome of managerial penny-pinching. Managing effectively, however, implies the maintenance of high quality care while patient and personnel needs are met at the same time. In other words a successful outcome to fiscal management, achieved by stringent economies, may result in lowering of patient care standards or a reduction in personnel motivation, psychic income and goal congruence. This is not an effective outcome. Conversely, highly successful patient care outcomes may be achieved but at excessive cost, which is inefficient. Effectiveness as well as efficiency of the whole system must be measured.

Effectiveness--The unattainable ideal of 100% effectiveness of hospital care, requires that all patients be fully restored to normal, productive life--that is 'cured'. More realistic measures of effectiveness would indicate that the optimum result has been obtained for any given disease process, depending upon age, other disease, social circumstances and psychological stability. The state-of-the-art on assessment of function has been briefly reviewed previously. The discussion in this section will be limited to measures of effectiveness applicable specifically to individual hospital patients--and how to assess the extent to which declared objectives have been achieved. It is once again necessary to stress that desired outcomes should be specified and that predetermined criteria, standards or norms against which achievement can be rated, are essential.

Many reports on the effectiveness of various therapeutic programmes have been published by the clinical staff of Teaching Hospital, resulting from retrospective surveys and prospective trials. Some cover long time-spans, others are limited to reports on the immediate outcome of a specific therapy. The list of publications is printed every year in the Annual Report for the Groote Schuur Hospital Group, and the interested reader is referred to that source for more detailed information on particular subjects.[54]

Emphasis here will be placed rather on the managerial approach--of all disciplines--to monitoring and evaluating the effectiveness of hospital treatment.

Approach to Evaluation

Georgopoulos and Mann summarised the standard approaches to evaluating effectiveness or quality of care in four categories.

1. Accreditation approach.
2. Statistical approach.
3. 'Satisfied-customer test' approach.
4. Clinical approach.[55]

This is similar to Shep's earlier statement that "the main techniques used in appraisal of hospital quality can be divided into--

1. The examination of prerequisites or desiderata for adequate care.
2. Indexes of elements of performance.
3. Indexes of the effects of care.
4. Qualitative clinical evaluation."[56]

The Accreditation Approach--or Examination of Desiderata--In the United States certain minimal structural requirements are laid down by the Joint Commission on Accreditation of Hospital (JCAH). These include such matters as organisation, qualifications of staff, number of beds, diagnostic and therapeutic facilities and services and record-keeping.[57] It is not considered that these requirements alone ensure effective care--which is confirmed by Georgopolous and Mann's survey of twelve community general hospitals. Their findings indicated that there was no significant correlation between physical facilities and quality of care but that the number and qualifications of medical and nursing staff and the effectiveness of overall co-ordination were highly significant.[58]

The Statistical Approach or Indices--Greenfield utilised the number of facilities and services provided in a hospital as a basis for calculating an index--the quality adjusted patient day (QAPD)--and then calculated the number of QAPD's per employee for a group of hospitals as a measure of productivity.[59]

No validation of this index is provided and its reliability as a measure of effectiveness, quality or productivity, is extremely doubtful. The idea has the appeal of simplicity, however, and meets Shep's requirement

of 'a relatively simple inexpensive, objective test of quality'[60] which might show a significant correlation with other qualitative measures. If the applicability of this or similar, uncomplicated indices could be established by careful research they would be of immense value--in preference to more difficult, cumbersome and expensive techniques.

Other statistical methods for evaluating process and outcome have resulted in an alphabet soup-mix of acronymic programmes--

In the United States these include--

Performance Evaluation Procedure (PEP)[61]
Professional Activity Study (PAS) and Medical Audit Programme (MAP)[62]
Quality Assurance Programme (QAP)[63]

In the United Kingdom--

Hospital Inpatient Enquiry (HIPE)
Hospital Activity Analysis (HAA)[64]
Scottish Consultant Review of Inpatient Statistics (SCRIPS)[65]

Of these PAS and SCRIPS seem to be the most detailed and informative--and appear, from the reports, to give the most useful feedback to individual clinicians and hospital management.

Cochrane advocates the use of Randomised Controlled Trials (RCT's) of health services, procedures, drugs and other treatment as the only true measure of effectiveness. His arguments are persuasive despite the acknowledged ethical difficulties (i.e. withholding treatment from the control group) of such trials. RCT's are a relatively inexpensive research techniques and it is disturbing that so few trials are conducted when, on the evidence presented by Cochrane, so much of the activity undertaken by health services is not effective.[66] It is worth noting that an extensive trial of this nature is currently in progress at Groote Schuur Hospital into the treatment of deep vein thrombosis.

The diversity and proliferation of statistical programmes for measuring the effectiveness of care is indicative of the difficulty experienced in obtaining valid measures. Recommendations for the collection of relevant statistical data for the Groote Schuur Hospital Group have already been discussed.

The 'Satisfied-Customer-Test' Approach--This method of evaluation has been discussed earlier in this chapter.

The Clinical Evaluation Approach--In the United States stringent requirements for clinical review of patient care have been laid down. These include routine submission of all surgically removed tissue for examination by the pathologist and subsequent review by the Tissue Committee; scrutinising of random samples of patient records for analysis and assessment of reason or need for admission, duration of stay and investigations and procedures performed--by the Record Review committee.

This medical audit is intended to be 'an objective and systematic way of evaluating the quality of care provided by physicians'.[67] In America medical audit is a statutory obligation for hospitals who must institute Peer Standards Review Organisations (PSRO's) to supervise the process of medical care, with respect to the medical Services which are reimbursed by the Federal Government. PSRO's are primarily intended to curb expenditure and do not assess outcome as such. Their value is questionable and the whole issue of medical audit is viewed with suspicion by doctors who consider that such mechanisms are an infringement of clinical freedom and a threat to their professional independence. The potentially punitive effects of medical audit are also viewed with disfavour. The concept of public accountability is not accepted by most doctors--particularly outside the United States. Conversely, the profession of medicine has traditionally subjected itself to a variety of peer-review procedures--death and complications and clinico-pathological meetings, ward rounds and case conferences at which diagnostic and therapeutic procedures, outcomes and error are openly discussed. This is a built-in control mechanism which could be expanded and systematised to ensure mandatory, routine case-review--educative, non-punitive, non-threatening and obviating the complicated, time-consuming and costly exercises required of the American hospitals.[68]

The Organisation of medical staff in British and South African hospitals imposes intrinsic controls on medical care procedures, which are lacking in the horizontal organisation found in the majority of American hospitals, while preserving clinical autonomy. This important factor may partially explain the slow acceptance of medical audit outside the United States.

Georgopolous and Mann used an extremely simple clinical judgement method whereby various categories of personnel in the hospital, and doctors outside the hospital, were asked to rank the quality of care provided by a group of twelve hospitals. They justified this approach with reference to previous analyses stating "those directly involved with the operations of the

organisation can make correct judgement about the performance of their respective units".[69]

They found a high correlation in the ranking of quality of individual hospitals from the various sources and were satisfied that their methodology was valid.[70] It is doubtful whether the information gained from such an 'informed-opinion' survey provides meaningful feedback on effectiveness of care or helps in any way to identify specific problems, if the survey indicates poor quality of care.

The approaches discussed in this section relate specifically to medical care and clinical evaluation. By definition the evaluation must be done by doctors whose time is costly and could possibly be better spent. Brook and Avery state that the cost of quality assurance/evaluation programmes is in the neighbourhood of two to five per cent of available medical care funds--and that the information obtained is seldom used to improve patient care.[71]

They also comment--with reference to American programmes--

> Data to evaluate the effectiveness of any method, (of quality evaluation) in terms of changes in provider behaviour or in the health of the patients whose care is reviewed, are sparse or non-existent.[72]

It would seem that theoretical desirability and practical application are divergent. The need for measures of effectiveness is not questioned, but methods of measuring and reporting must be sought which are inexpensive, reliable, meaningful, simple and useful to the clinicians. Medical Staff decisions are responsible for approximately 80% of resource utilisation in hospitals and it is medical staff behaviour which must be modified by feedback on the effectiveness or otherwise of their activities.

Proposals for Assessing Effectiveness at Groote Schuur Hospital

1. Desired outcomes of hospital care must be clearly defined for each disease entity by the medical staff, and criteria for judging both process and outcome must be stipulated.

2. Individual in-patients should have treatment plans and desirable outcomes specified. This would be facilitated by the use of the problem-oriented record.[73]
   Implementation of Weed's medical record system is taking place at Groote Schuur Hospital in a few departments at present and should ultimately be used throughout the hospital.

3. End results of care must be compared with the predetermined standards. Variation from the standards must be reported and discussed. Death and complications meetings, clinico-pathology meetings and case review studies should be systematic, routine, non-threatening, obligatory events. Hospital-acquired infection should be constantly monitored, reported and investigated. The educational re-inforcement value of these techniques cannot be over-valued.

4. RCT's of different protocols for investigation and treatment should be conducted--particularly into those aspects of hospital care where numbers of patient or costs are high--such as comparisons of in- and outpatient care, teaching hospital vs. satellite unit care, intensive care units vs. general ward admissions. Matters such as patient compliance and reduction in length of stay also merit study by this method. Decreased duration of in-patient stay requires particular investigation, as it is suspected that early discharge policies contribute significantly to recurrence, relapse and re-admission rates--costly for patient and hospital.

5. Comparative information for clinicians should be provided routinely--condensed, valid, relevant information--timeously produced in easily readable format. As has been suggested earlier, the use of existing computer stored data is feasible, and a survey is being done of clinicians' requirements for information.

6. The use of health indicators and their applicability in measuring the effectiveness of individual hospitals requires intensive investigation. The development of simple indices such as Greenfield's QAPD and the use of statistical controls and analyses to validate such indices is essential. The collaboration of clinicians, administrators, sociologists and statisticians is necessary for both research and development in this field.

7. If health indicators and other indices are developed, one of the most important uses of such measures would be for assessing the cost-effectiveness of different inputs to the health (and hospital) service and in aiding decision-making on resource allocation.

Evaluation of the Quality of Nursing Care

No assessment of the effectiveness of nursing care has been done at Teaching Hospital, despite the impressive progress which has been made in

this field in both the United Kingdom and the United States--chiefly the latter. Several organisations have developed Quality Control methodologies for nursing--the most commonly reported being those developed by the Commission for Administrative Services in Hospitals and the Rush-Presbyterian-St Luke's Medical Centre programme.[74] These methodologies utilise questionnaires and investigators, concerned with all aspects of nursing related to the process of inpatient care--including psycho-social parameters. The Rush-Presbyterian-St Luke's Medical Centre project is of particular merit as regards concept, methodology and application. In the United Kingdom, research into measurement of nursing care effectiveness was sponsored by the Royal College of Nursing and the Department of Health and Social Security. Several investigations were undertaken which concentrated on various categories of nursing activity including the psycho-social needs of patients. This work was specifically aimed at developing objective standards or criteria of quality.[75] McFarlane has undertaken an extensive review of the literature up to 1970 which would be of considerable value if Groote Schuur Hospital attempted to institute a nursing care evaluation programme.[76] It is considered that this should be done as a project undertaken by the Nursing Service at Groote Schuur Hospital.

Operations Research and Management Engineering have been used extensively in other countries to evaluate the effectiveness and efficiency of the outcome of Patient Care and an extensive literature is available.[77] Once again the problem of finding and appointing suitably qualified experts is a matter for concern, particularly in a service where such posts do not exist and the need for such expertise is not yet recognised. This is a deficiency which must be remedied if South African hospitals are to apply management science concepts to assuring effective patient care.

SUMMARY

The product of the hospital is a combination of output and outcome where outputs result from the conversion of inputs in the process of achieving objectives--and outcome is the measurement of the extent to which the objectives are accomplished.

Analysis of output of the patient care function of the Groot Schuur Hospital Group, concerns comparatively simple measures of activity and utilisation, in quantitative terms. Data collection methods are poorly specified for many occasions of service and standardisation of procedures

and units of measurement is essential to ensure comparability of information. The purposes for which data is collected must also be clarified and understood.

Measures of outcome may be considered in two categories--external and internal. External measures include health indicators, promising methods of measuring health care outcomes, which still require considerable refinement. Other qualitative assessment can be obtained from consumer attitudes and responses to hospital care derived from opinion surveys, Community Health Councils and the offices of a health Ombudsman. Patient surveys are now being conducted regularly at Groot Schuur Hospital which are proving of value in tailoring the service to the needs of the patients.

The Teaching Hospital Board and Advisory Committees could serve a more useful purpose if their roles were enhanced to include active consumer complaint review, and greater community representation and participation in the affairs of the hospital.

Internal measures of outcome are related to both efficiency and effectiveness and traditionally have been concerned as much with process as with outcome. Efficiency is concerned with the economical and technical aspects of the hospital and the ratio of cost to benefit. There are few existing measures of efficiency of outcome (as opposed to process), and further investigation into readmission rates and incidence of complications is necessary to ascertain whether these will serve as valid indicators. Well designed data processing systems, including computerisation are essential to provide relevant, accurate and timeous information for administrators and clinicians.

Measures of effectiveness--the extent to which the hospital has restored patients to maximum health and the quality of the process through which the patient has passed--have proved elusive. Many programmes of evaluation and assurance have been developed--accreditation, statistical comparisons and clinical evaluation. These methodologies tend to be cumbersome, expensive, time-consuming and, according to some critics, have not achieved any change or improvement in the quality of care. Randomised Controlled Trials and the intrinsic monitoring procedures of the medical staff organisation are considered to be of the greatest potential value.

Standards and criteria for assessing the effectiveness of outcomes of treatment must be determined by clinicians. On-going assessment of all in-patient treatment based on these criteria will facilitate control and evaluation of both process and outcome.

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8. CONCLUSIONS

The Groote Schuur Hospital Group is a system. It contains many subsystems and is itself a subsystem of a larger suprasystem. It has defined boundaries which separate it from the environment. There is a constant flow of information, materials and other inputs from the environment which must be processed and converted to outputs. The hospital is negentropic, subject to constant change, differentiation and growth, and is self-regulatory--controlled by feedback of information from the environment and from within the system itself. It can achieve its ends by a variety of means--the principle of equifinality.

Studying the hospital as a system makes it possible to understand the relationships of the organisation with its environment, the relative influence of the various participants, and the goals and values which legitimise the hospital's continued existence. Analysis of the resource inputs facilitates understanding of the financial management; the needs, interactions and utilisation of the human elements concerned; and the effect of the physical factors of design and construction of the buildings within which the hospital functions. The constraints imposed upon the system by technology and the need for a constant flow of materials are clarified.

Further examination of the socio-technical system, which is responsible for the process of conversion, elucidates the structure of the organisation, its managerial subsystem and the decision-making/information processes. Finally, the hospital's product, particularly the patient-care element can be analysed as one of the means whereby the hospital's achievements can be evaluated.

It has not been possible or perhaps necessary to examine every aspect of the Groote Schuur Hospital Group as a system. Certain matters which most directly affect the efficient, effective and economical management of the organisation have been discussed and further research into these and other matters has been recommended. Hospital administration is a rich field for study. The conclusions reached in this work are open-ended and in many instances do no more than point the way to more detailed investigation and analysis.

THE IMPORTANCE OF THE ENVIRONMENT

The many participants, both environmental and internal who influence the activities of Groote Schuur Hospital have been discussed in Chapters 1 and 2. Rhenman's attempted analysis of the contribution/inducement balance of the participants, is an interesting approach to the study of power related to cash flows in and out of the hospital.[1] It is considered, however, that more useful information could be obtained from examination of the factors which bring about changes in policy and practice, whether these emanate from the environment--the suprasystems, the larger society, commerce and industry--or from within the hospital--personnel, patients and technology. An analysis of decision-making in the hospital management and executive committees was inconclusive, and not considered to be of value in assessing the influence of the various participants, as the original source of the determining cause for policy changes was frequently obscured by transmission through numerous channels. Hospital policy and practice is in any event not always initiated by top management, but may result from ad hoc measures at the operating level, which are implemented in a gradual manner in response to pressure and demand from a variety of sources.

The effects of many environmental factors alter hospital policy insidiously and cannot be directly related to any one body or organisation. Socio-economic factors alter the pattern of hospital attendances, admissions and disease incidence--and affect hospital policy. Changes in Government policy, pressures of various kinds exerted by neighbouring and overseas states, and changing societal attitudes all affect the policies and activities of the hospital. Competition from other institutions may threaten the inflow of financial, human and material resources--and patients--necessitating policy revisions and renewed efforts to ensure the hospitals' viability.

Hospital administrators need to be constantly aware of these trends which will affect the continued flow of resources, patients and other inputs. These must be continuously monitored and suitable action taken to maintain the organisations dynamic equilibrium. The institutional level's prime responsibility is interaction with those people and organisations whose influence, decisions and actions may affect the hospital's growth, development or survival--and to plan and control the hospital's activities in the light of the information received from all sources--both internal and external.

DEFINITION OF GOALS

> Goals must reflect the needs, demands and expectations of the society they serve. Seen in this way, the hospital is a social system that seeks to fulfil certain goals that contribute to a larger social system.[2]

It is essential that the Groote Schuur Hospital Group define its role and its goals in terms of community needs and with reference to the Health Act 1977. In order to do so, information must be obtained on the many social, demographic, environmental and medical factors which determine the general hospital's functions. This information must be sought not only from health professionals, but also from the consumers--whose unexpressed needs may be more significant than their stated demands. It is considered that health care personnel have a major contribution to make, which should not be discounted as merely self-serving, or protective of vested medical interests and monopolistic professional empires.[3]

Objective data on socio-economic and disease profiles must be collected and considered in relation to the academic responsibilities of the hospital, as well as its patient care and other community service functions.[4]

In-depth research is essential, in order to establish the course which Groote Schuur Hospital will follow in the future. Uncertainty, and social and political change make identification of needs, priorities and goals particularly difficult, but these must be determined if the institution is to retain the support of the society it serves.

PLANNING AND CONTROL

Planning is dependent upon the control mechanism of feedback of information. Furthermore, implementation of planning decisions must be supervised and controlled or little will be achieved. It is therefore appropriate to consider these two factors together.

Groote Schuur Hospital is an academic, general hospital primarily concerned with curative health care, training of health care personnel and research. Increasing emphasis on preventive and restorative services is apparent, however, in Governmental health policy.[5] Furthermore, it is poor practice to treat a patient as an isolated acute medical problem, or for the curative hospital services as a whole to concern themselves with only one aspect of disease. Education of students of all disciplines, in preventive and rehabilitative aspects of health care, must be an essential part of

their basic training. Health education of patients, as well as their restoration to maximal productive well-being, are essential components of curative medical practice. Prevention of recurrence of disease, or deterioration in a patient's health status, is integral to the treatment of acute disease. Family planning, ante- and post natal services, genetic counselling, and other services provided by the Group are essentially preventive in nature. Physiotherapy, occupational therapy, speech therapy, social work and psychiatry are basically rehabilitative.

The hospital is therefore already involved in all three aspects of health care and, once its goals have been defined, will have to plan for a more balanced allocation of resources between its activities in these three spheres and for greater outreach to the community--based on assessment of need. This exercise should incorporate planning and implementation of alternative means of providing health care such as day surgery, pre-admission investigation units, extended outpatient hours and more community-based ambulatory patient services.

Groote Schuur Hospital Group planners must also take cognizance of the needs of the associated Medical Faculty with its requirements for teaching and research. Provision of accommodation and other facilities to meet these needs in the patient care field are accepted as the hospital's responsibility--and must be incorporated in all planning.

Financial Planning

The fast escalating costs of hospital services are due to a variety of factors which require identification and quantification. Planners need accurate information on the causes of hospital inflation and on the consumption of resources to enable management to devise methods of containing costs, while maintaining a high standard of service and motivation of personnel. The part played by the pharmaceutical and medical equipment and supplies industries in the rising costs of hospital care, is cause for concern and requires further investigation and control by the manufacturing countries.

Financial planning follows on the assessment of all participants' and community needs, definition of goals, and setting of priorities. Programme-budgeting and cost-effectiveness analysis are sophisticated techniques for improving financial planning which are costly and require considerable expertise. They are not therefore considered suitable for use at Groote Schuur Hospital--as originally described. The principle of rational, informed

decision-making for long-term planning, budgeting and review is, however, valid and should be investigated with a view to devising suitable methods for use in the Group. Information on the costs of all functions and activities is essential for financial planning and for effective financial management and control.

Long-term planning is hindered by uncertainty regarding the availability of funds from one financial year to the next, and 'rolling' budgets or other means of assuring that projects will proceed as planned, would facilitate this managerial task.

Resource Utilisation

Planning and control also entails analysis of resource utilisation and the institution of more effective, efficient and economical ways of achieving the hospital's goals. Scheduling of procedures to avoid delays and unnecessarily prolonged admissions; analysis of the "optimal length of stay" for specific procedures; ensuring optimal bed occupancy; avoidance of unnecessary admissions and attendances; referral of patients to more appropriate centres for follow-up care; reduction in the number of investigations and medications; control of hospitals acquired infections and many other aspects of hospital practice must be considered in planning and controlling the consumption of resources.

Management must also ensure that personnel are properly utilised in tasks which match their skills and that delegation of routine tasks to non-specialists does not result in decreased efficiency. Flexibility should be built into training programmes where possible and deployment of personnel must be planned to achieve satisfactory standards without waste and redundancy.

Buildings must be planned to ensure that scarce and costly manpower is most effectively utilised, that patients are not seriously inconvenienced or endangered by having to move long distances from one service to another, and that duplication of accommodation and equipment is avoided where possible. Buildings and equipment are comparatively minor items of expenditure in relation to total operating costs and due recognition must be given to this fact in the planning and design of hospital buildings. Flexibility is essential in planning hospital accommodation to allow for fast-changing requirements and growth of specialised services.

Equipment purchases must be planned for optimal utilisation and reduction in manpower and the purchase, storage, distribution and control of consumable supplies must be planned in accordance with principles of economy

and efficiency.

Personnel Planning

The teaching hospitals, as part of larger community health systems, have a particular responsibility for training, recruitment and allocation of health service personnel and must plan their teaching programmes in accordance with community, professional and administrative needs. Planning must also encompass the needs and goals of the hospitals' employees both professional and non-professional, whose morale and motivation should be a major concern of hospital management at all levels. Planning for the Groote Schuur Hospital Group must include the development of professional personnel management and correction of the factors which lead to employee dissatisfaction, high turnover rates and absenteeism--inadequate remuneration; inequitable compensation, lack of supplementary benefits and other generally applicable reward systems, poor interpersonal relationships and other disincentives.

Particular attention should be paid in planning, to job definition and evaluation, job enrichment and provision of motivators to ensure satisfaction of the higher level needs for esteem and self-actualisation of all employees. Planning of staff: patient ratios, allocation and utilisation of personnel must take into account the relationship between staff numbers and the quality and effectiveness of service, and the apparent correlation between a high ratio of medical and nursing staff and quality of care.

The professionalisation of nurses and the essential co-ordinating role of the trained nurse are important factors affecting the future planning of hospital services, as is the increasing specialisation of many other categories of hospital workers. Planners must pay particular attention to the problems which will arise from role expansion of clinical and administrative nursing staff. As the 'production component' of the hospital service nurses perform an important administrative function. If, with professionalisation, these co-ordinating managerial tasks are delegated to other lower paid, less competent and less dedicated workers there may be a decline in overall efficiency and effectiveness.

Operations Research

Quantitative techniques of many kinds are available to assist hospital planners in their task and application of these skills to building design, allocation of personnel, scheduling of patient attendances and other aspects

of hospital administration is an exciting prospect. Operations Research is a comparatively undeveloped science in this country and it is therefore considered unlikely that Groote Schuur Hospital will be able to employ these techniques generally at the present time. For planning and design of the extensions to the hospital, it is considered that it would be economically justifiable to hire experts from overseas to assist local planners. Assistance with other applications can perhaps be obtained on an ad hoc basis from Universities or other institutions.

ORGANISATION AND CO-ORDINATION

Proposals for restructuring the organisation of the Groote Schuur Hospital Group envisage an organic matrix structure, formalising the existing polycentric, collegial relationships which are responsible for the professional tasks in the hospital.

> The study of hospitals ... on the level of the comparative and quantitative analysis of organisations, suggests that the complex hospitals of to-day represent a post-bureaucratic form of organisations which may well become the prototype of modern organisations in general.[6]

Heydebrand states that the greater the differentiation and specialisation in the organisation, the greater the need for different modes of co-ordination, structural, professional and administrative, with decentralisation of administrative control and concurrent centralisation of information processing.[6]

It is considered that the matrix structure provides the framework for the scalar hierarchy, which controls the routine, repetitive, non-professional work of the hospital, to coexist harmoniously with autonomous, horizontally integrated, professional units. The essential support services--both administrative and technical would then intermesh on a more structured basis, to supply and maintain the programmes which performs the basic patient-care, teaching and research functions of the hospital (and medical school). This network of interaction will provide the necessary links between the bureaucratic and professional organisations, which are personified by the medical superintendent, but which are weak or missing at other levels in the hospital. Dual control systems are integral to the matrix structure and to hospitals.

Co-ordination of these multiple activities can best be achieved by the use of various categories of personnel, at the different managerial levels, to act as integrators and 'linking-pins'. The formation of teams in wards,

theatres and units incorporating programme and possibly unit managers, is seen as a potentially effective mechanism for co-ordinating and controlling the variety of specialists, professionals and ancillary personnel who constitute the operating level of the hospital organisation. Careful selection and appropriate training of these integrators and managers from all disciplines is essential.[7]

> Future shock is neither a disease nor a disaster; it is a dilemma created by too many problems coming too fast from too many directions for traditional problem-solving tools and techniques to handle. It seems that groups of 'Argus men' aided by both cybernetics (system analysis) and electronic computation--as well as by behavioural scientists--are capable of integrating multi-man skills and disciplines into antidotal, discreet, problem-solving organic entities of the future. There is an urgent need to develop and perfect this morphology, a new science of man/machine/organisation dynamics. 8.

It is considered that the use of effective integrators will reduce organisational/professional conflict and promote internalisation of the hospitals goals by the multidisciplinary patient care and support service teams, as well as permitting the medical staff to retain autonomy and self-regulation.

In this context, medical administrators are perceived as having an essential function to perform as chief executive of the hospital and as senior managers. Fisher states that the successful co-ordinator requires technical expertise as well as other specific characteristics.[9] This knowledge enables the medical administrator to assess clinical needs, evaluate services, define and supply relevant information for clinicians, keep the balance between competing empires, develop new services, and assist the clinicians in performing their managerial functions. Medicine is a high status profession which will not accept regulation by lay administrators, as indicated by the many mechanisms which exist in British and American hospitals to organise the medical staff. Relationships with the environment, in the context of existing societal values, are enhanced by the standing of the chief executive as a doctor. There does not seem to be an acceptable alternative, in the present circumstances, to the medical hospital administrator. It is considered, however, that training as an administrator is essential to enable the doctor to perform effectively and efficiently in this challenging role.

The successful matrix must be democratic and decentralised. Delegation of authority and control and participation in decision-making by all levels of management is essential if the organisation is to be effective, and can be promoted by the use of committees and specially constituted project groups

and by wide dissemination of information. Policy-making must remain a centralised function to ensure that the complex polycentric subsystems are all working towards overall organisational goals. Departmental heads, however, must be given and trained to exercise, a considerable degree of autonomy in their individual departmental activities and to accept responsibility for decision-making or planning and policy issues as well as resource consumption.

The point has been made by several writers that large hospitals (over 1000 beds) are uneconomical and inefficient compared with smaller institutions.[10] It is therefore essential that more effective means of co-ordination be sought for Groote Schuur Hospital, which will have a total of 1722 beds on the main hospital site when total redevelopment, now in the planning stage, is completed. The development of independent parallel organisations to administer the medical, surgical and gynaecological/obstetrical divisions may become necessary--with centralised support services and administration responsible for overall planning, co-ordination and financial control. This would be the logical development of the decentralisation process now proposed, with each division being administered as a separate enterprise, served by a discrete support and maintenance system--with all the components forming a federated type of organisation. This possibility should be borne in mind in the planning and design of the new buildings.

It is considered that the principle of decentralisation should be extended to the hospital's relations with its suprasystem and that regionalisation of hospital services in the Province should allow for much greater delegation of authority to Regional Medical Superintendents, within the framework of centralised policy-making, budgetary allocations and public accountability. Economy of time, effort and money would result from an increase in the autonomy of the Regions, with greater flexibility permitted in the expenditure of funds within the budget, and elimination of unnecessarily restrictive requirements for Hospitals Department approval of expenditure and other 'internal' hospital matters. Academic training for hospital administrators both medical and others would facilitate smooth transference of control from the Department of Hospital Services to the Regions.

EVALUATION OF ORGANISATIONAL EFFECTIVENESS AND EFFICIENCY

The product of the Groote Schuur Hospital Group has three components--treated patients, trained personnel and the results of research. Only the

first of these, which is considered to be the major product of the Provincial hospitals' function--as opposed to the University's responsibility for teaching and research is examined in some detail.

Evaluation of the effectiveness and efficiency of the Group's patient care activities must encompass identification of objectives; analysis of the process whereby the objectives are achieved; description and standardisation of activities; measurement of the effect of the activities and the efficiency with which the effect has been achieved.[11]

> Our view of hospital output, is that it is a complex function of the number of inpatients plus outpatients treated per time period, the types of illnesses on admission, the quantity and quality of human and physical resources applied to the patient and some scalar measure of the success of treatment--zero if no effect, positive if the patient improves, and negative if the patients' condition deteriorates as a result of hospital care.[12]

Measures of output which indicate hospital activity, are relatively easy to obtain, although standardisation of data collection is imperative to ensure that the information is meaningful and comparable. Measures of outcome--that is of the effectiveness and efficiency of the activities--are as yet ill defined and those which are in general use, apply to structure and process as well as outcome. Qualitative as well as quantitative means of assessing the hospital's product are necessary and can be obtained from both external and internal sources. In this regard the following suggestions are made--

1. The opinion of the community served by the hospital, which legitimises its continued existence, must be sought by means of surveys and through representative bodies.

2. Health Status Indices reflecting the effect of hospital care on the community should be developed.

3. Standards of structure, process and outcome must be defined against which achievements can be measured.

4. Uniform methods of data collection and simple, valid indicators of effectiveness and efficiency must be developed. Accurate costing of all functions and activities is essential.

5. Clinicians' requirements for useful information should be determined - and accurate, relevant, timeous reports on clinical activities and outcome must be sent to departments and 'firms' on a regular basis.

6. This information should be used by departments as a basis for routine evaluation of their activities, efficiency and the extent to which objectives have been achieved, in comparison with predetermined standards.

7. Randomised controlled trials allied to cost-effectiveness analysis are useful analytical methods which should be utilised for evaluation of alternative processes and outcome.

8. Particular attention should be given to the development of measures of the quality of nursing care in the Group.

The professional staff--mainly medical--have constantly researched, monitored and evaluated their treatment of patients--and compared their outcomes with studies from other centres. This work does not, however, cover all departmental activities and relates in most instances to particular disease entities, diagnostic procedures and therapy. This valuable research will obviously continue but a more general evaluation of all patient care, as now proposed, is considered essential to enable all levels of hospital management to measure, control, improve and plan the hospital's functions.

INFORMATION PROCESSING AND DECISION-MAKING

Every aspect of hospital management is dependent on information for decision-making. Information can come from the environment or from within the organisation, as feedback on existing hospital activities, or it may be received as new information on changing environmental circumstances and developments, not necessarily related to the hospital's present functions. Information from the environment is difficult to monitor and assess for relevance and immediacy and is received at many levels in the organisation. Much of it arrives in a haphazard and uncontrolled manner and its significance may not be appreciated.

Effective informal interaction between the institutional level of management and the environment is critical to the acquisition of relevant information but formal methods of obtaining data must also be instituted and the type and volume of information which is needed must be determined.

Internally, the overall control and processing of information must be centralised. Exact requirements must be specified and relevant data must be routinely supplied to top management for policy-making, planning, control

and evaluation. Information however, must be disseminated as widely as possible to ensure that all managerial levels have the necessary information for decentralised control and decision-making.

Departmental heads, programme and service managers must be provided regularly with information on costs, resource consumption, output and outcome--based on their own requirements and for comparison with other units. Successful delegation of managerial responsibilities for control and decision-making is entirely dependent on the availability of valid data. Informal channels of communication must be encouraged and the flow of information in all directions must be absolutely free and unrestricted to ensure that every person in the hospital is aware of institutional goals, policy and needs and can communicate their thoughts, feelings, objectives, needs and knowledge laterally and vertically.

Large complex organisations such as the Groote Schuur Group, which are both bureaucratic and professional organisations with clearly defined hierarchies, experience serious problems with communications and should investigate the use of action-learning and other methods of improving morale and effectiveness by improving communication.

Computerised information systems with a variety of applications are already available for the Group and more are in the process of development. Computerisation is essential for processing of the great volume of data which is generated by the hospitals' activities. There are however, many disadvantages which must be considered when planning electronic data processing. It is extremely costly; the man/machine interaction requires considerable adaptation on the part of the human elements of the organisation; the quality of the information obtained is entirely dependent upon the degree of care with which the original data is collected and entered; the quantity of data produced can be overwhelming; and assurance of confidentiality of the computerised records requires complex controls and constant surveillance.

Most of the information needed for management cannot be obtained from the existing manual systems. Functional budgeting, cost analyses, staff turnover, demographic data on patients, outcome information and indicators of effectiveness and efficiency can only be processed and analysed by electronic data processing techniques. The potential of real-time hospital information systems for improving the administrative and clinical aspects of patient care are considerable and are beginning to be realised. It is considered that rational management of all aspects of the hospital's function

will be greatly enhanced by computerisation.

FURTHER RESEARCH

Hospital Administration in South Africa is a relatively neglected subject. In other countries, however, the volume of literature produced on the topic is overwhelming, indicating the degree of interest in and the amount of work which has been done in this field. Each issue of Hospital Abstracts, published monthly, contains summaries of approximately 160 articles from 60 books and journals, published in 15 countries.[13] It is contended that there is an equal need for research into all aspects of hospital administration in this country.

Several major areas have been identified for further research which are listed below and other recommendations have been made in previous chapters.

1. Investigation of alternative and fairer systems of remuneration for hospital employees, including research into the validity of a 'value-index' for use in weighting different categories of personnel. This could be incorporated into a point rating or factor--comparison method of job-evaluation with general applicability throughout the Public Service.

2. Research into the relationship between staff:patient ratios and the quality, efficiency and effectiveness of the service. This should include:

   2.1 Analysis of the effect of increasing the number of medical staff on outcome of patient care.

   2.2 Investigation of methods for assessing quality of care--particularly nursing care and setting of standards.

   2.3 Allocation and scheduling of nursing personnel and the use of a 'Pool' of nurses.

   2.4 Methods of classifying patients according to dependency.

   2.5 Extension of methods to other categories of staff.

3. Analysis of the effects of professionalisation of personnel--particularly nurses--on hospital activities and management.

   3.1 Investigation into the consequences for patients and the organisation, of delegation of routine tasks by professionals in all disciplines.

   3.2 Cost effectiveness of delegation and its effect on efficiency.

4. Assessment of community needs for health care and the establishment of rational need norms. This must include:

   4.1 Definition of the hospital's role in meeting these needs in terms of the Health Act 1977.

   4.2 Investigation and implementation of alternatives to inpatient care.

   4.3 The development of consumer surveys--both for assessing expressed needs and for evaluating existing services.

5. Investigation into data collection, statistics and indices--

   5.1 Definition of purposes for which data is collected.

   5.2 Analysis of requirements and standardisation of collection methods.

   5.3 Training of clinicians in the use of information for management.

   5.4 Development of indices for measuring effectiveness and efficiency.

These proposals cover a wide field and are far from comprehensive. They have been selected for particular study, on the basis of urgency or significance, as related to improvement of the hospital's product by more effective or efficient utilisation of resources.

The road ahead is uncertain. The Teaching Hospital's role in the Health Service system of the future has not yet been determined.[14] Every effort must be made by all who participate in the management of the hospital, to ensure that the Groote Schuur Hospital Group not only remains viable but maintains and improves on the standards set in the past forty years. Hospital administrators must be well-informed, adaptable, concerned, committed, and capable of providing the organisation with positive and dynamic leadership.

In 1889 John Shaw Billings said in an address on the opening of the Johns Hopkins Hospital--

> A Hospital is a living organism made up of many different parts having different functions, but all these must be in due proportion and relation to each other, and to the environment, to produce the desired results. The stream of life which runs through it is incessantly changing, its work is never done; its equipment is never complete; it is always in need of new instruments and medicines; it is to try all things and hold fast to that which is good. [15]

Hospitals have not changed in essence but the world in which they operate has changed immeasurably and is still changing. The challenge is great to develop new modes of hospital administration which will 'try all things and hold fast to that which is good'--in pursuit of the ideal of excellence.

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